

**Design, Construction,  
Operation of Metal-  
Working Equipment  
and Manufacture of  
Metal Products**

# MACHINERY

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SEPTEMBER, 1947

NUMBER 1

Editor

CHARLES O. HERB

Associate Editors

FREEMAN C. DUSTON

HOLBROOK L. HORTON

CHARLES H. WICK

VALLORY H. LAUGHNER

Consulting Editors

ERIK OBERG

FRANKLIN D. JONES

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President

EDGAR A. BECKER

Vice-President and Treasurer

HAROLD L. GRAY

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Advertising Representatives

LOUIS PELLETIER

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DWIGHT COOK

148 Lafayette St., New York 13, N. Y.

EDWARD K. HAMMOND

GEORGE H. BUEHLER

228 N. La Salle St., Chicago 1, Ill.

BOYCE TOPE

568 Maccabees Bldg., Detroit 2, Mich.

DON HARWAY & COMPANY

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## MACHINE TOOL SHOW NUMBER

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This issue of MACHINERY, which covers the Machine Tool Show, contains the greatest number of illustrated descriptions of new machine tools and allied equipment we have ever published. It will, therefore, be an invaluable aid for a long time to come to executives of the metal-working industry who are responsible for the selection of cost-reducing manufacturing equipment.

October MACHINERY will include articles dealing with a wide variety of subjects, such as automatic flame-hardening, expansion fitting with liquid nitrogen, the forging of aluminum and magnesium, and a unique involute checking machine designed for use on large helical gears, as well as the Condensed Review of Recently Developed Materials, which for some years has been a popular annual feature with MACHINERY's readers.



Product Index 506-527

Advertisers Index 529-530

Total Distribution for August, 22,732

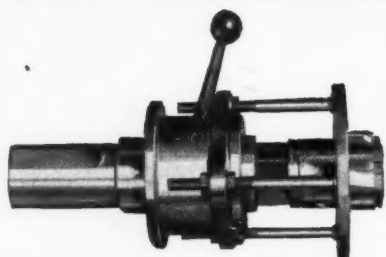
# THE LATEST IN Thread CUTTING, IN ACTUAL

Visit the  
**LANDIS**  
MACHINE COMPANY  
**EXHIBIT • BOOTH**  
AT THE No. 101  
**Machine Tool Show**  
SEPTEMBER 17-26  
CHICAGO

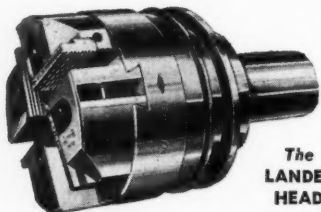
Varied threading jobs—from high-speed production to maintenance and jobbing operations—by cutting, grinding, and rolling methods—will keynote the exhibit. The equipment illustrated will be in operation on typical work pieces, and booklets will give basic data on the equipment and the operations performed.



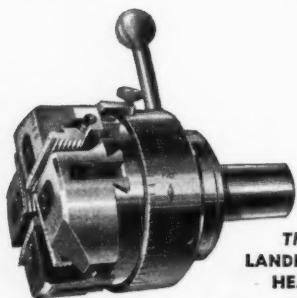
The LANDIS No. 1 CENTERLESS  
THREAD GRINDER



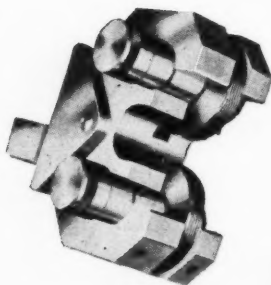
The LANDIS ALT COLLAPSIBLE TAP



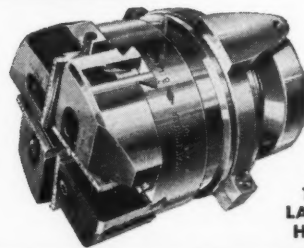
The  
LANDEX  
HEAD



The  
LANDMATIC  
HEAD



The  
LANROLL  
ATTACHMENT



The  
LANCO  
HEAD

# LANDIS

# MACHINERY

Volume 54

SEPTEMBER, 1947

Number 1

## *The World's Finest Machine Tools*

METAL - WORKING industries the world over have their eyes focussed on the Machine Tool Show. First, because America today indisputedly produces the finest machine tools available anywhere, and second, because the United States is about the only nation in a position at the present time to export machine tools on a substantial basis. Most European countries are so busily engaged in rehabilitating their own industries with this type of manufacturing equipment that they are unable to provide competition in the world's markets.

AND the machine tool industry is ready to have world-wide buyers appraise its latest developments. Ever since the war, the designers of that industry have been concentrating on new and improved models that make possible the application of techniques developed during and after the war—machine tools that operate faster and more efficiently even than the equipment of past years which enabled American manufacturers to establish the highest production records—machine tools that will again result in reduced manufacturing costs despite abnormally high labor and material costs.

PRODUCTION executives will find in this number of MACHINERY a comprehensive review of new and improved machine tools and accessories that will be seen at the Show for the first time outside of their builders' plants. Manifold differences will be apparent over the exhibits of the last Machine Tool Show twelve years ago, such as automatic controls of electronic and mechanical types, electronic motor drives, automatic feed changes that insure a constant horsepower delivery, adequate power for utilization of the newest cutting materials, and many other advanced features. The machine tool industry again has met the demand for equipment that will enable higher production efficiency to be attained in metal-working plants.

SO here are the world's finest machine tools for selection by the industrial executives responsible for obtaining results in the machine tool using industries—many of whose photographs are shown in the following pages. These are the men who, by applying the most modern cost-reducing equipment, will maintain and increase our high standard of living, and thus insure the continuance of American free enterprise.

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# More Goods for More People

---

By HERBERT H. PEASE

*President, the New Britain Machine Co. and  
President, National Machine Tool Builders' Association*

THE 1947 Machine Tool Show to be held at the Dodge-Chicago plant this month is more than the greatest exposition of a single industry ever held anywhere; it is Exhibit A on the side of free economy, in behalf of the general welfare of the people of our country and of the world. It will offer graphic proof of our American contention that, under the competitive system, machines have shortened hours, raised wages, and made it possible to manufacture the things we need for our high standard of living at prices that people can afford to pay.

IT will show our key relationship in the metal-working field to the markets of the world. In the war period, American machine tools were, for the most part, frozen in the interests of quantity production. But during the war years there was constantly building up, under the stress of great pressure for production, knowledge as to possible new developments and techniques which would represent substantial improvement in performance. As long as the war went on, little was done beyond the drawing-board stage. With peace, came the translation of the drawings to actual new models representing the seven years' cumulative advances in the design of the basic tools of all industry—machine tools.

WAR experience opened the eyes of conservative plant superintendents to the greater economy of modern equipment. Plants that had been "getting by" with old machine tools discovered during the war that they had been operating under

the handicaps of slow production and high cost. Their management will never again be content to operate with such antiquated tools. Lowered costs of production are an absolute necessity if we are to maintain our competitive advantage and capitalize on the lessons of the war. We have long preached to the metal-working industry the necessity of keeping costs under control by increasing the productivity per man and per dollar expended. People are going to expect prices to come down on what they buy—while, at the same time, they are seeking higher prices for what they sell.

BUT the nation's over-all volume of business is larger than it was before the war. Our population is growing. Our needs are greater. People have come to expect more in modern comfort and conveniences, and they will not willingly return to a lower standard of living. Their increased demands will continue to increase. So the test of the American system is at hand. We must produce more goods for more people if we are to prove that our capitalistic system is better than some other plan that can be tried. The basic solution to a higher average production is a greater number of better tools in the hands of the men and women who produce. Our domestic economy requires it.

THE entire world is modernizing its manufacturing processes. Countries that were not industrial nations can become suppliers of the world's needs. New markets are opening up everywhere, and the American machine tool industry is

## at Lower Cost

the logical immediate source of supply. Germany, one of our great competitors in pre-war days, is out of the running for the time as a supplier of machine tools. England's output is seriously hindered by her domestic difficulties. Production in other war-torn nations will be absorbed largely by demands at home.

**A** NEW era is ahead for industry in South America. There will be a great expansion there in the basic industry—steel. The steady growth of manufacturing will be helped by the interest evidenced by young men from South America who are studying in our American technical schools. Needless to say, such expansion calls for a great increase in the basic tools—the machine tools, which are the first step in all industrial advance.

**N**ATIONS today face the choice of planned economy or free enterprise. In America, we believe that as a nation we can have more only if we produce more. We believe that we can sell more only if the product and the price are right. We recognize that today there is a buyer's market. When we make more goods for more people at lower cost, we can raise still higher the standard of living which we enjoy today in the United States. Our high standard of living is not an accident; it is due to constant improvement in the tools of production.

**T**HAT is why the 1947 Machine Tool Show will be devoted to the single objective of showing how costs of production can be reduced through machine tools of modern design. More than one thousand machines, most of which will be shown in actual operation, will represent the latest tools for the American way of life—more goods for more people.



**N**OT only the leaders of industry, but bankers and educators and government officials will attend this Show. They realize that here, for the first time in twelve years, all the basic tools of industry will be gathered together in one place.

**C**OMPETITION is here again. All management must be sales-minded. Every company in every manufacturing field must keep a step ahead or at least in step with competition. Only by seeing and selecting the latest and best machine tools can concerns in the metal-working industries do that. In twelve years there has been a great advance in machine tool design.

**I**NDUSTRY is pressing forward with a broad program of development. The new machine tools of the 1947 Machine Tool Show will provide a great incentive for the modernization of many plants, and this will be reflected in increased sales. Then we will have proved again that, under the free economy system, more people can buy more goods, and that greater productivity brings lower prices and higher wages.

# Latest Production Equipment

*Machine Tools and Other Metal-Working Equipment which will be Introduced to Production Executives for the First Time at the Machine Tool Show to be Held at the Dodge-Chicago Plant, Chicago, Illinois, from September 17 to 26, Inclusive*

## **Micromatic Precision Honing Equipment**

**Booth 323**

A new line of honing machines and tools built by the Micromatic Hone Corporation, 8100 Schoolcraft Ave., Detroit 4, Mich., will be exhibited at the Show. This equipment, the Microhoner machines and Micromold utility tools, is designed for general tool-room use, semi-production, and salvage or reconditioning work. Electronic tubes are used to control the automatic Microsize device on these machines. Mechanical linkages, springs, and jewel bearings have been eliminated, minimizing service and maintenance.

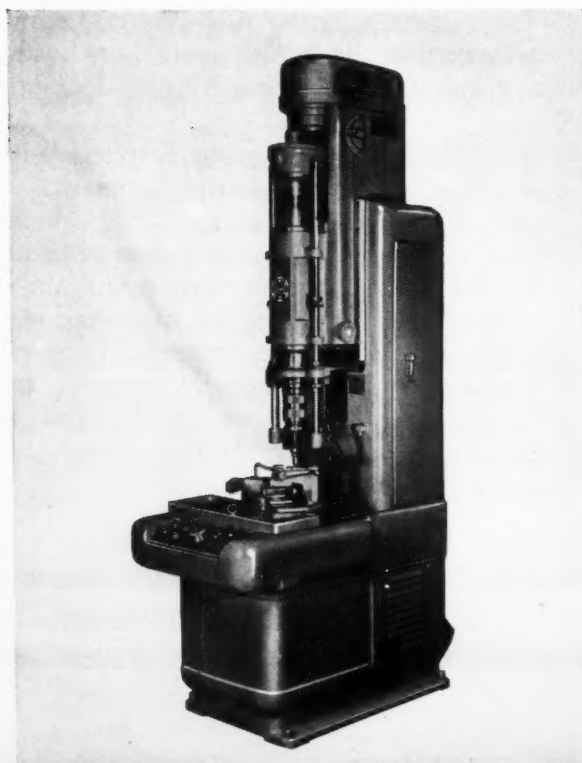
Electronic Microsizing control makes it possible to hold the bore-to-bore size to 0.0003 inch or less in production. Combined with multiple-spindle machines having automatic rotating indexing fixtures, Microsizing equipment has made it possible to hone progressively. As much as 0.012 inch of stock per minute can be removed from hard steel parts.

Microsize control is made up of a gage ring, a Micromold tool with the abrasive sticks molded into a plastic stone-holder, and an electrical control circuit. The gage

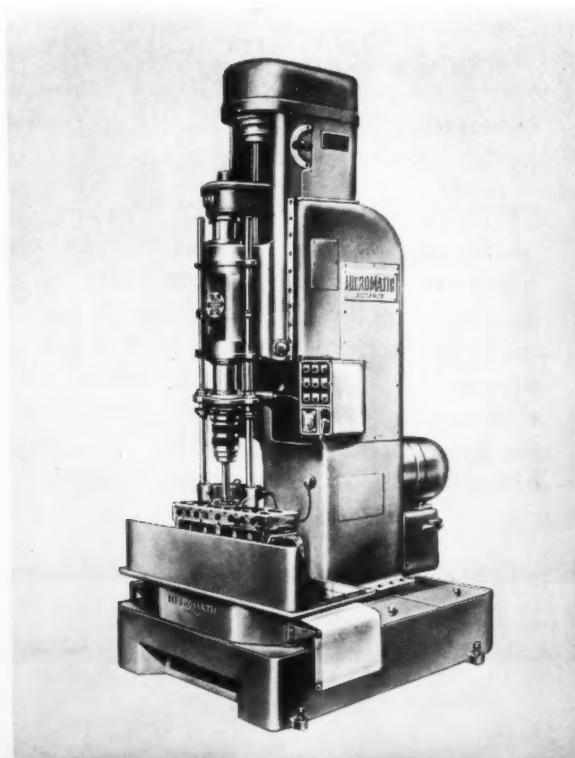
ring contains a Norbide insert having an inside diameter equal to the low limit of the desired bore size. This ring is located so that only the upper ends of the plastic stone-holders enter it, as the tool strokes through the bore and the ring. The plastic ends wear down with the abrasive sticks. When the bore has been honed to size, the friction between the gage ring and the plastic causes the ring to rotate. The electronic circuit then directs the hydraulic circuit to stop the tool expansion, allowing for a predetermined run-out time and finally collapsing and withdrawing the tool from the bore.

One of the machines in the line

**Fig. 1. Micromatic Vertical, Quill Type. Single-spindle Honing Machine for Bores up to 2 Inches Diameter by 8 Inches Long**



**Fig. 2. Single-spindle Machine Tooled for Microhoning a Four-cylinder Automobile Engine Block with 2 1/2-inch Bores**



# to be Seen at the Show

## *Outstanding Features of Machines Designed to Meet Today's Production Problems in Manufacturing and Tool Shops—This Section Includes Only Machines and Tools of New or Improved Design that have Not Previously been Described*

is a unit-constructed, single-spindle, heavy-duty Microhoning machine with quill type spindle for honing bores from 1 to 4 inches in diameter and up to 9 1/2 inches long. This type of machine is made up with the following three units assembled on the column and base of any other Micromatic honing machine: The head unit, consisting of spindle, hydraulic control panel, stroke control mechanism, and speed control transmission; the hydraulic unit, comprising a hydraulic pump, tank, and pressure control valves; and the electrical unit, consisting of an electronic control panel. The spindle is the piston-rod, with rings that act as the piston. Accuracy

of spindle alignment with the work-piece is insured by having the torque and thrust taken by the quill directly above the tool.

The vertical quill type single-spindle machine shown in Fig. 1 can be adapted for Microhoning bores up to 2 inches in diameter by 8 inches long. Another quill type machine (Fig. 2) will be tooled to Microhone a four-cylinder engine block having 2 1/2-inch bores. This is a single-spindle machine with a capacity to hone bores up to 4 inches in diameter by 7 inches in length. It is completely automatic and equipped with a lateral indexing table. The three-spindle Microhoning machine seen in Fig. 3 is adapted for the

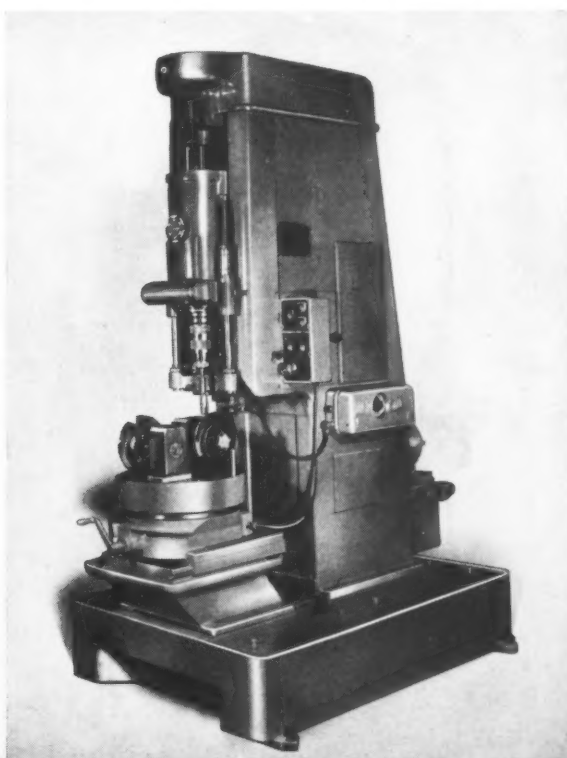
honing of bore sizes from 1/4 to 1 inch in diameter by 5 inches long. It is entirely automatic and roughs, semi-finishes, and finishes the bores progressively. A standard general-purpose vertical machine (Fig. 4) is designed for Microhoning 3/4- to 2-inch bores having a maximum length of 6 1/2 inches.

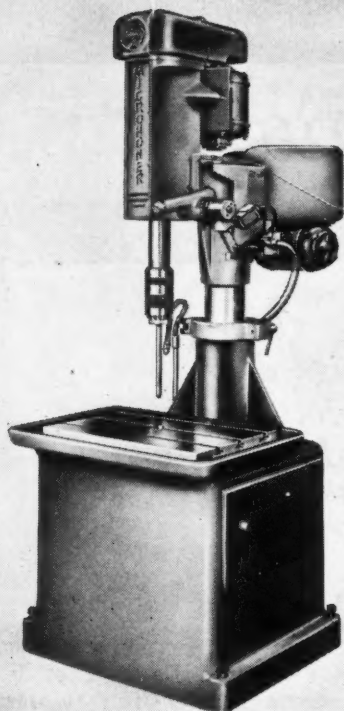
The mechanical Microhoner machine shown in Fig. 5 is designed for maximum flexibility, having six rotation and four reciprocation speeds. The stroke and head-to-table distance, as well as the speeds, are adjustable so that one machine can be used to hone a range of bore diameters from 1/2 to 4 inches with a maximum

**Fig. 3. Microhoning Machine with Three Spindles for the Progressive Honing of Bores from 1/4 to 1 Inch in Diameter**



**Fig. 4. General-purpose Vertical Honing Machine for Bores 3/4 to 2 Inches in Diameter with Maximum Length of 6 1/2 Inches**





**Fig. 5. Mechanical Microhoner Machine which has Six Rotation and Four Reciprocation Speeds**

length of 7 inches. Tool expansion is controlled by rotating an adjusting sleeve, mounted on the spindle. The head is counterbalanced, and the starters for the rotation and reciprocation motors are interlocked with the lift-out arm. The operator has only to shift the lift-out arm to stop, start, or "inch" the spindle rotation and reciprocation.

Also to be displayed are a vertical automatic machine tooled to externally hone refrigerator pistons; a quill type single-spindle machine for work ranging from 0.250 to 1.00 inch in diameter by 6 inches long; a double-spindle machine for honing two connecting-rods simultaneously; and a machine that progressively hones gear blank bores.

## **Landis Centerless Thread Grinder and Thread Rolling Machine**

Booth 101

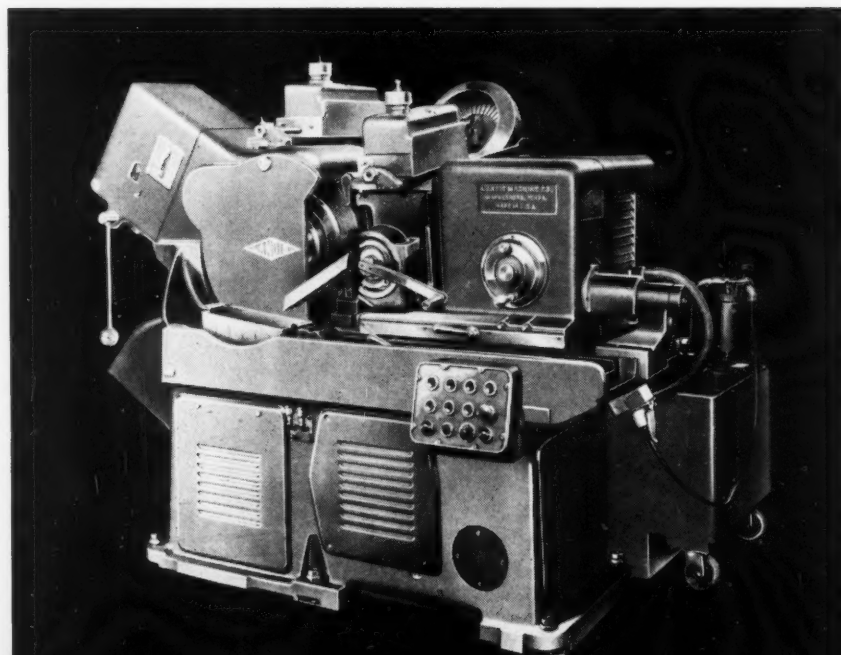
Grinding of screw threads on straight cylindrical pieces, as well as on headed or multiple-diameter

parts, can be done on the centerless thread grinder shown in Fig. 1, which is built by the Landis Ma-

chine Co., Waynesboro, Pa. Single-diameter pieces are ground by the "through feed" method, which consists of passing the work in a continuous flow between the grinding and the regulating wheels. Headed or shouldered pieces and multiple-diameter parts are ground by the "in-feed" method. Both methods can be used either to grind threads from solid blanks or to finish threads that have been cut prior to the centerless thread-grinding operation.

The pitch and form of thread to be produced is crushed in the grinding wheel by means of a heavy-duty automatic crush-dresser, attached directly to the bed of the machine. A geared motor is incorporated in the dresser for driving the crusher roll and the grinding wheel at a slow speed during the dressing operation. The control for this motor is interlocked with the main driving motor control to prevent contact between the grinding wheel and the crushing roll when the grinding wheel is rotating. Pre-selection of the depth of penetration and automatic stopping of the crusher when the desired penetration is reached are possible.

The Landis thread rolling machine, Fig. 2, provides facilities for rolling screw threads, knurling, marking, and similar operations on cylindrical parts. An entirely new principle permits the rolling of screw threads on one, two, or more diameters of a piece in a single pass through the machine. Although especially designed for the thread-rolling of studs having fine-pitch threads on one end and coarse-pitch threads on the opposite end, the machine is equally capable of rolling the threads on two different major diameters of step or shouldered studs in one operation. The threads



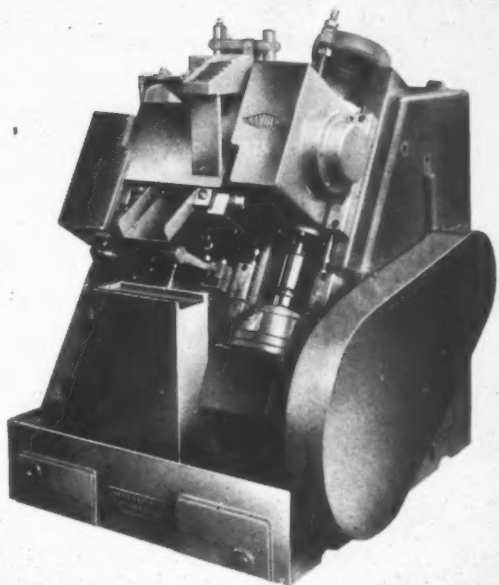
**Fig. 1. Landis Machine for the Centerless Grinding of Screw Threads on Straight, Headed, or Multiple-diameter Cylindrical Work-pieces**

can be rolled on socket-head cap-screws and the knurling of the head completed simultaneously.

Circular dies and a work support interposed between the mating dies are used for positioning the work during the rolling operation. Two continuously rotating parallel spindles support the dies. Moving slides are not required for feeding the dies to the required thread depth. The dies have the thread forms generated on a spiral contour for controlling the rate of penetration. A concentric portion of the die is used for finishing the thread on the work. The piece remains in one position on the work support during the entire rolling operation, thereby insuring concentricity of all threads generated on the part.

The machine is completely automatic in operation, a hopper feeding mechanism being available

**Fig. 2. Machine Built by the Landis Machine Co. for Rolling Screw Threads, Knurling, Marking, and Similar Operations on Cylindrical Parts**



when desired. Magazine feeding may also be used when the shape of the work precludes the use of an automatic hopper. All classes of commercial thread tolerances can be produced.

manual adjustment; positive table screw feed with adjustable nut backlash eliminator; and single-shot, metered lubrication for table and saddle ways. These machines are available in four feed and six speed ranges.

Other new or improved machines to be shown by the company are the Model 5D rotary-head milling machine; the Models B and C autometric precision boring machines; the Model 2E simplified milling machine; and the Models 3T and 3TT precision milling and boring machines. In all, there will be twenty-eight machines in operation at the Show demonstrating improvements in design and operation.

## **Kearney & Trecker Automatic-Cycle Milling Machines**

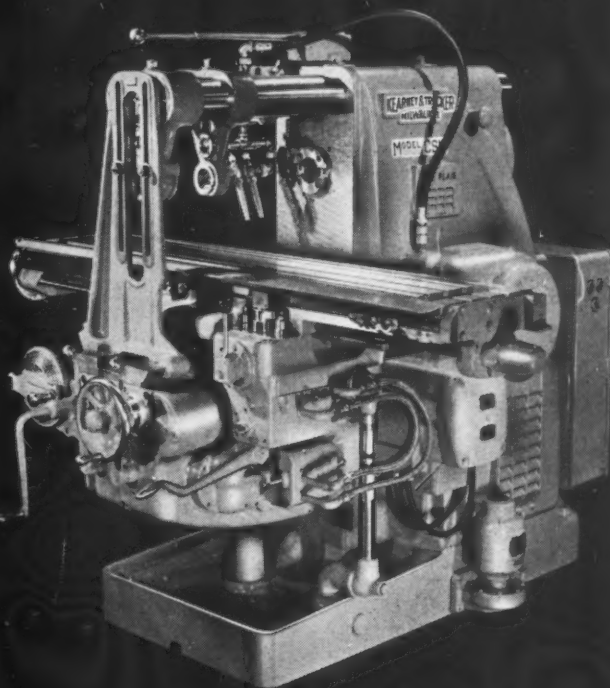
**Booth 301**

Among the new developments of the Kearney & Trecker Corporation, Milwaukee 14, Wis., is a line of thirty-two knee type milling machines ranging from 3 to 50 H.P. and equipped with automatic table cycle control.

Designed and built in plain and vertical styles, these models combine the advantages of both knee type and production milling machines. Features of the line include the choice of manual or automatic cycle operation; predetermined cycle time, making uniform hourly production possible; quick-change speeds and feeds; six-way power rapid traverse, with the spindle stopped or

running; single-lever directional control for the table feed or rapid traverse; pull-out plunger that automatically controls the table movement from rapid traverse reversal to feed reversal; rapid-set micrometer dials for fast

**One of a Line of Thirty-two Kearney & Trecker Automatic-cycle Milling Machines Available in Models from 3 to 50 Horsepower**



## Fellows Planetary Gear Shaper

Booth 107

A revolutionary development of the Fellows Gear Shaper Co., Springfield, Vt., will be displayed at the Show. This is a planetary gear shaper (illustrated in Fig. 1), which produces at least four times the number of external spur or helical gears that can be made on a single-spindle gear shaper. It employs a large gap type cutter, shown in the center of Fig. 2, around which the work moves in planetary fashion. The cutter is reciprocated, but is not rotated. The work is held on individual work-spindles carried in the rotating turret. The work-spindles are driven by individual worms and index-wheels which are kept in step with the turret rotation. The work-spindles are held in "aprons," which are provided with individual relieving mechanisms that withdraw the work from contact

with the cutter when the cutter is on the return or non-cutting stroke.

The cutter is provided with groups or series of teeth, separated by gaps, the number of teeth in each group being equal to the number of tooth spaces in the work. The teeth in the various groups are arranged to divide the amount of stock to be removed to produce the gear teeth, and the final group finishes the teeth of the gear to the desired depth and tooth thickness. Cutting is progressive from roughing to finishing in one operation and in one setting of the work. A large gap in the cutter permits inserting and removing the work. The work-spindles remain at a fixed distance

relative to the cutter during the cutting stroke.

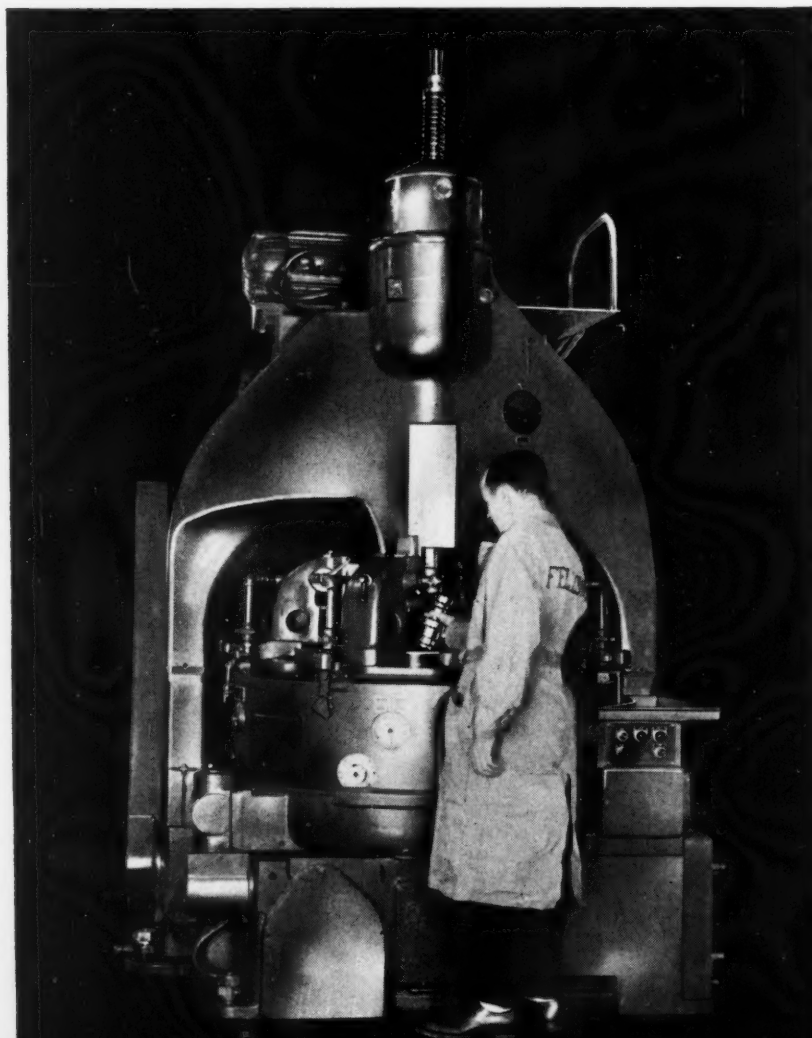
The machine shown has provisions for locating the work when it is held on an arbor requiring support at the upper end. Each support has two operating levers, one for raising and lowering the "tailstock," and the other for clamping it. Various types of work-holding outfits have been designed for use on this machine to facilitate loading, operation, and unloading.

The machine is provided with complete electrical control. A signal light on the control panel indicates when the machine has completed the cycle, thus notifying the operator that the machine is in position for reloading.

Other new machines which the Fellows Gear Shaper Co. expects to display are a ten-station gear shaper for cutting external and internal spur and helical gears; a general-purpose gear shaper for cutting gears up to 36 inches in diameter; and a gear-shaving machine for external and internal spur and helical gears.

**Fig. 1. (Left) Fellows Planetary Gear Shaper for Cutting External Spur and Helical Gears**

**Fig. 2. (Above) Turret of the Machine Shown in Fig. 1. The Gears being Cut have a Planetary Movement around the Central Cutter**







# *Men Responsible for Results in the Machine Tool Using Industries*

On this and following pages, MACHINERY pays tribute to some of the important men who apply the master tools of industry in the production of metal products on a scale that makes possible our high standard of living — men who will be vitally interested in the potentialities of the new equipment to be seen at the Machine Tool Show



William P. Coomey, General Superintendent, Rice Barton Corporation, Worcester, Mass.



Dr. Charles F. Kettering, Director, General Motors Corporation, Detroit, Mich.



J. H. Horstman, Vice-President and Factory Manager, Robbins & Myers, Inc., Springfield, Ohio



J. Joachimi, Superintendent of Tooling and Manufacturing, Bell Aircraft Corp., Buffalo, N. Y.



L. J. Male, General Superintendent, Schenectady Works, General Electric Co.



H. R. Costley, General Factory Manager, Nash Motors Div., Nash-Kelvinator Corp., Kenosha, Wis.

*Men Responsible for Results  
in the Machine Tool Using Industries*



H. J. Schorle, Works Manager,  
Worthington Pump & Machinery  
Corporation, Holyoke, Mass.



R. C. Stupp, Vice-President, Man-  
ufacturing, Jack & Heintz Preci-  
sion Industries, Inc., Cleveland



D. A. Wallace, President, Sales  
Division, Chrysler Corporation,  
Detroit, Mich.



Walter C. Alvin, General Super-  
intendent, The Imperial Brass  
Mfg. Co., Chicago, Ill.



C. F. Downing, Superintendent of  
Process and Tool-room, Globe  
American Corp., Kokomo, Ind.



Theo. G. Vickers, Master Mechanic,  
Frost Gear and Forge Div., Clark  
Equipment Co., Jackson, Mich.



C. E. Palmer, Works Manager,  
Mechanics Universal Joint Div.,  
Borg-Warner Corp., Rockford, Ill.



E. E. Bollinger, Factory Manager,  
Inland Manufacturing Div., General  
Motors Corporation, Dayton, Ohio

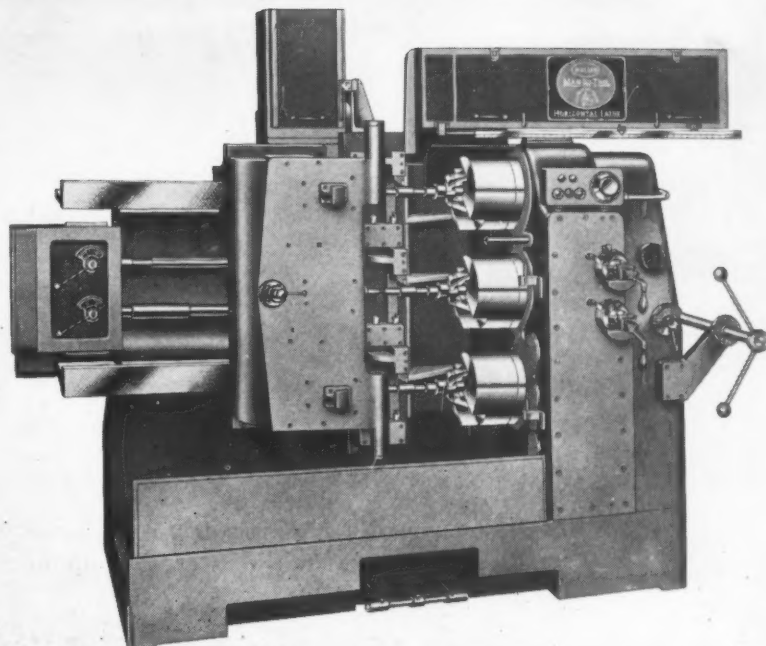


G. H. Smith, Vice-Pres. and Gen.  
Manager, Deepfreeze Div., Motor  
Products Corp., North Chicago, Ill.





**Fig. 1. Bullard Three-spindle Model 30 Man-Au-Trol Horizontal Lathe Can be Manually or Automatically Operated**



## ***Bullard Three-Spindle Automatic Lathe and New Multi-Au-Matic***

**Booth 314**

A three-spindle horizontal lathe that is operated automatically through thirty-nine different functions by a Man-Au-Trol control, and a new Type K high-speed Multi-Au-Matic are among the exhibits of the Bullard Co., Bridgeport 2, Conn., never before displayed. The design of the lathe is unique in that the tools are mounted vertically on a slide in back of the vertical plane in which the three spindles operate. This gives complete accessibility to the work and allows chips to drop out of the way with the coolant.

Sixteen feeds, ranging from 0.0003 to 0.0156 inch, and forty speeds, from 50 to 1200 R.P.M., can be obtained. The design provides for semi-automatic loading and unloading of parts. Angular or taper turning is achieved by combining the vertical and longitudinal feeds. The Man-Au-Trol control, which is a hydraulic-electrical system, does away with delays for measuring, sizing, and similar operations customarily performed by the operator and keeps the machine at work continuously. However, if desired, the lathe can be switched to manual control by the movement of a single lever without disturbing

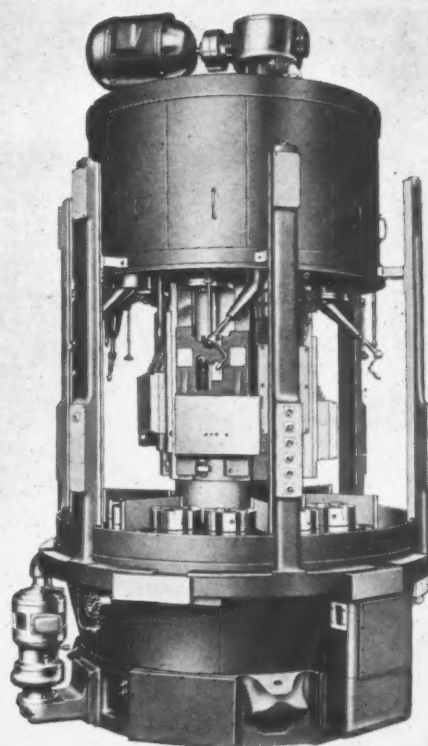
the set-up for automatic operation. Multiple tools can be brought automatically into action, either one after another or simultaneously, or one tool can be used for several different cuts. The weight of the lathe is approximately 20,000 pounds. A motor drive of 75-H.P. capacity can be used.

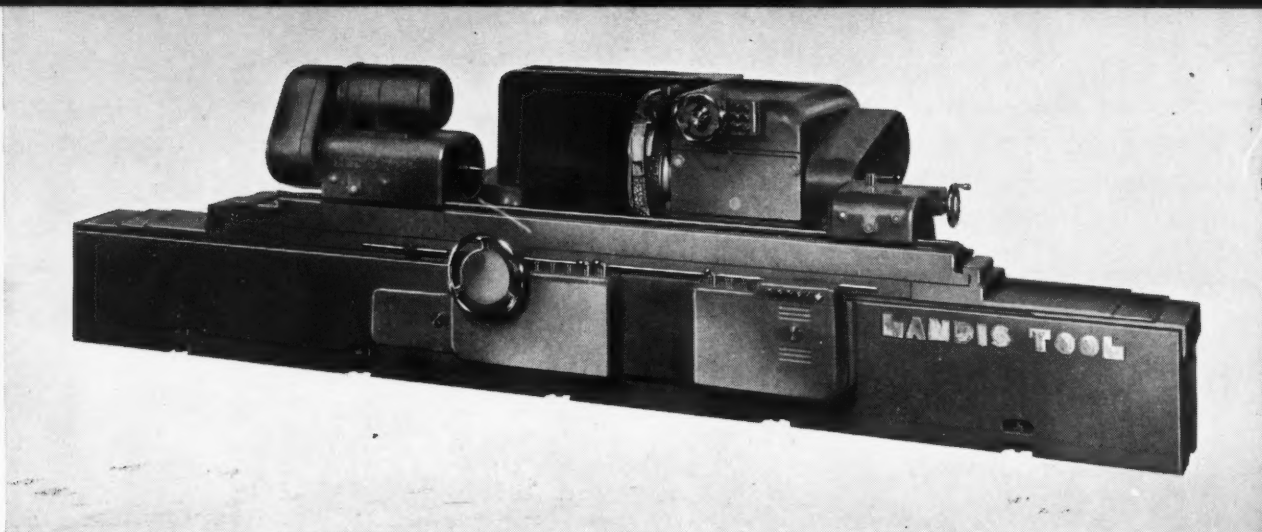
The new Type K Multi-Au-Matic is available with six, eight, twelve,

or sixteen spindles operating at speeds up to 900 R.P.M., or three times the speed previously available. The 15-ton six- or twelve-spindle model has speeds from 100 to 900 R.P.M. The 21-ton eight- or sixteen-spindle machine operates at 98 to 883 R.P.M. Both models have forty-one speed changes and eighty-two rates of feed, with selective feeds and common speeds at all stations.

Other features include a new indexing cycle control, semi-automatic chucking, and an adjustable stroke of slides to accommodate various heights of work.

**Fig. 2. The New Multi-Au-Matic Shown Here is a Modification of the Standard Multiple-spindle Machine, and is Designed for Speeds up to 900 Revolutions per Minute**





**Fig. 1. Landis Plain Hydraulic Grinder that Accommodates Work 14 Inches in Diameter and up to 96 Inches in Length**

## ***Hydraulic Grinding Machines to be Exhibited by Landis Tool Co.***

**Booth 303**

The 14- by 96-inch Type F plain hydraulic grinder, Fig. 1, shown by the Landis Tool Co., Waynesboro, Pa., has been designed especially with a view to providing convenience of operation and operating efficiency. The basic machine swing is 16 inches, but it can be furnished in 14-inch, 20-, 24-, 30-, or 36-inch swing. Between-center lengths are 48, 72, 96, 120, 144, 168, 192, 216, and 240 inches. Wheel diameters are 30, 36, or 42 inches. Weight-carrying capacities of 6500 or 10,000 pounds are available in plain, gap, and roll grinder designs. Roll-grinding equipment includes the Landis tool crowning and concaving mechanism.

A traverse of 3 to 90 inches per minute is provided by an adjust-

able-speed hydraulic motor through a gear train to a carriage rack. Changes in hydraulic viscosity do not affect this traverse rate. Also, varying loads do not affect the traverse rate after it has once been set.

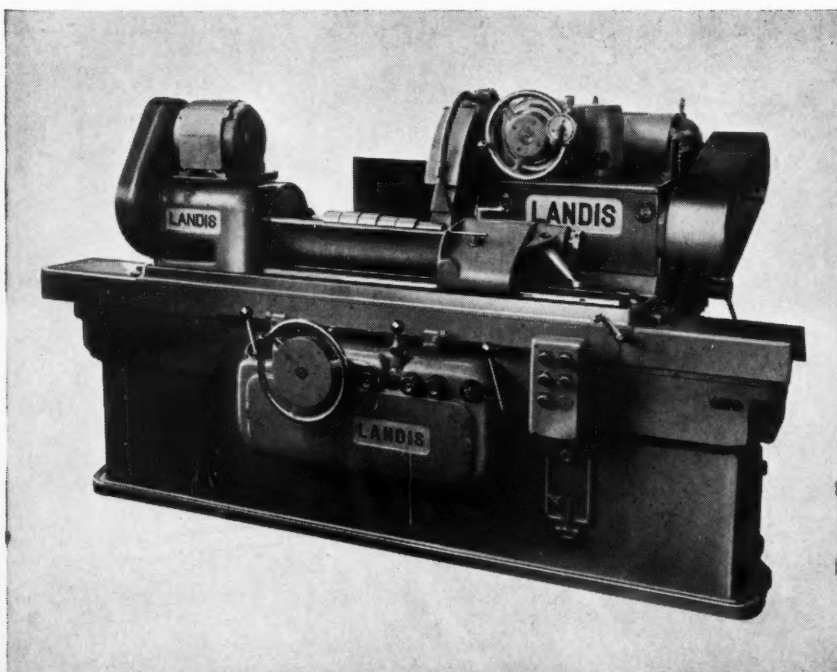
Hydraulic and lubricating oils have individual reservoirs and pumps. The coolant pump is installed in a three-compartment, 180-gallon capacity tank section at the rear of the machine. The tank is baffled to settle suspended solids, with the pump supplying coolant from the cleaning compartment.

Microsphere bearings, lubricated from a wheel-base reservoir having an individual motor and filter, carry the wheel-spindle. The bearings are sealed, and pressure must

be built up in the bearing housing before rotation can start. A hinged fender side affords easy access to the grinding wheel.

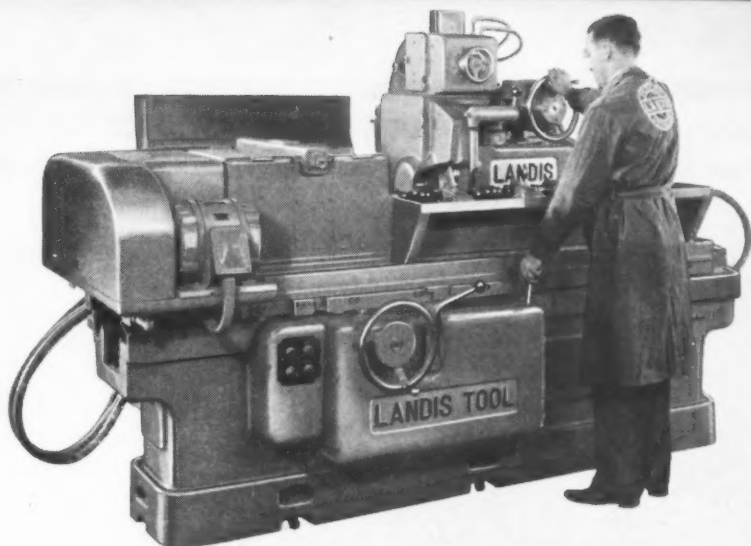
Four kinds of in-feed, supplementing the handwheel feed, can be supplied as follows: Hydraulic rapid in-feed and slow cross-feed for production work; electric rapid in-feed for small lots or widely varying diameters; automatic feed, functioning at each or either reversal of the carriage (this feed can be used with the hydraulic or electric rapid in-feed); and hydraulic rapid in-feed with direct-acting dashpot for use where long slow feeds against webs or faces are required.

The 10- by 36-inch Type CH plain hydraulic grinder shown in Fig. 2 is equipped with a new multiple stop device which provides a means of grinding several different diameters consecutively by referring to a dial mounted on the hand-feed wheel. Reference points



**Fig. 2. Plain Hydraulic Grinder Made by the Landis Tool Co. for Grinding Several Different Diameters Consecutively**

**Fig. 3. Landis 5- by 40-inch Cam Contour Grinder for the Production Grinding of Camshafts**



are preset on the graduated ring to correspond with the diameters to be ground. Provision has been made for ten stops on the dial, which is graduated in 0.001 inch increments to 0.100 inch. Automatic feed rate, actuated at each carriage reversal, is from 0.00025 to 0.003 inch. Machines of this type are built in 6-, 10-, and 14-inch swings, with distances between centers of 18 to 120 inches.

The irregular shape of the work, combined with the high degree of accuracy required, makes the production grinding of camshafts a highly specialized precision grinding application. The 5- by 40-inch Type DH cam contour grinder (Fig. 3) is designed for such work. Microsphere wheel-spindle bearings, V-belt headstock drive, automatic slow-down of work rotation for finishing a more accurate contour, automatic stopping of headstock in convenient loading position, hydraulic index-

ing from cam to cam with oil temperature variation compensation, and automatic adjustment of wheel wear caused by dressing are features of this machine. A companion machine provides for grinding camshaft line bearings.

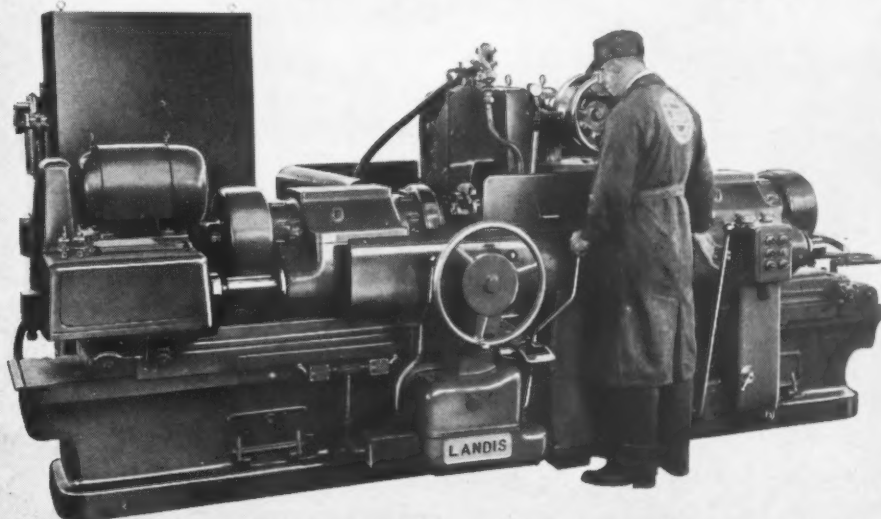
The use of a large-diameter grinding wheel, hydraulic carriage travel, hydraulic clamping of work fixtures, and the ability to grind pins without removing the crank from the machine are outstanding features of the 16- by 42-inch Type DH crankpin grinder shown in Fig. 4. Heavy work-heads driven in unison by matched silent chains through a longitudinal shaft, automatic positioning of work-head rotation, and choice of hydraulic or manual clamping are other features.

Hydraulic interlocks on the machine prevent traversing the table when grinding or when rotating the work-heads while dressing with the work unclamped or during

table traverse. Also, the table cannot be traversed with the work-rest shoe in the operating position. Lack of hydraulic system pressure stops the work from rotating. The grinding wheel feed is hydraulic, handwheel feed being provided to compensate for wheel wear. New automatic air sizing or indicating type gages can be furnished. A single lever controls traverse, work clamping, work rest, and work-head rotation. This grinder can be supplied in 16- and 25-inch swings for crankshafts 32, 42, and 72 inches long.

Also to be exhibited are a 10- by 20-inch hydraulic universal grinder with a new swinging bracket type internal fixture; a 4- by 12-inch plain hydraulic grinder equipped with hydraulic in-feed, profile dresser, hydraulically operated footstock, and new visual-automatic sizing device; and a centerless grinder with vibrating type loading device.

**Fig. 4. Landis Crankpin Grinder with New Automatic Air Sizing Gages and Other New Features**



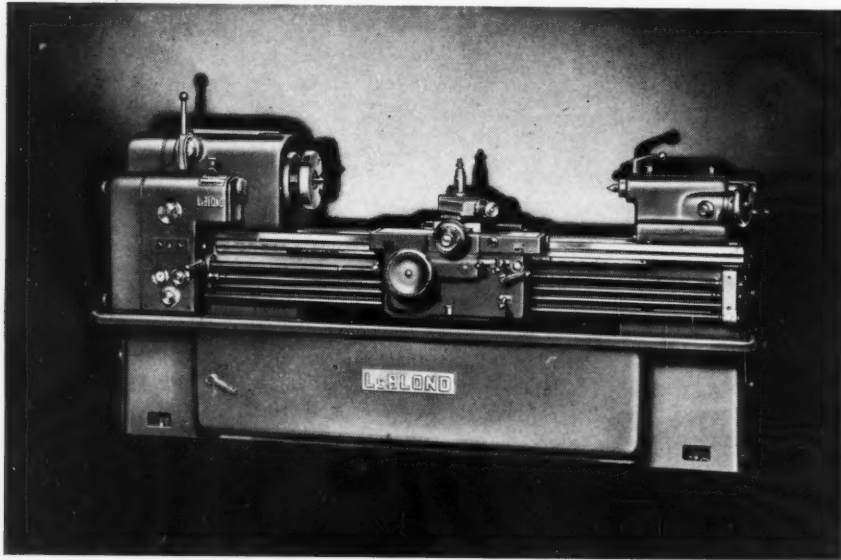


Fig. 1. (Left) LeBlond 16-inch Lathe with a Single Control Lever on the Headstock

Fig. 2. (Below) LeBlond 25-inch Heavy-duty Engine Lathe with Totally Enclosed, Automatically Lubricated Quick-change Gear-box

## LeBlond Heavy-Duty Lathes

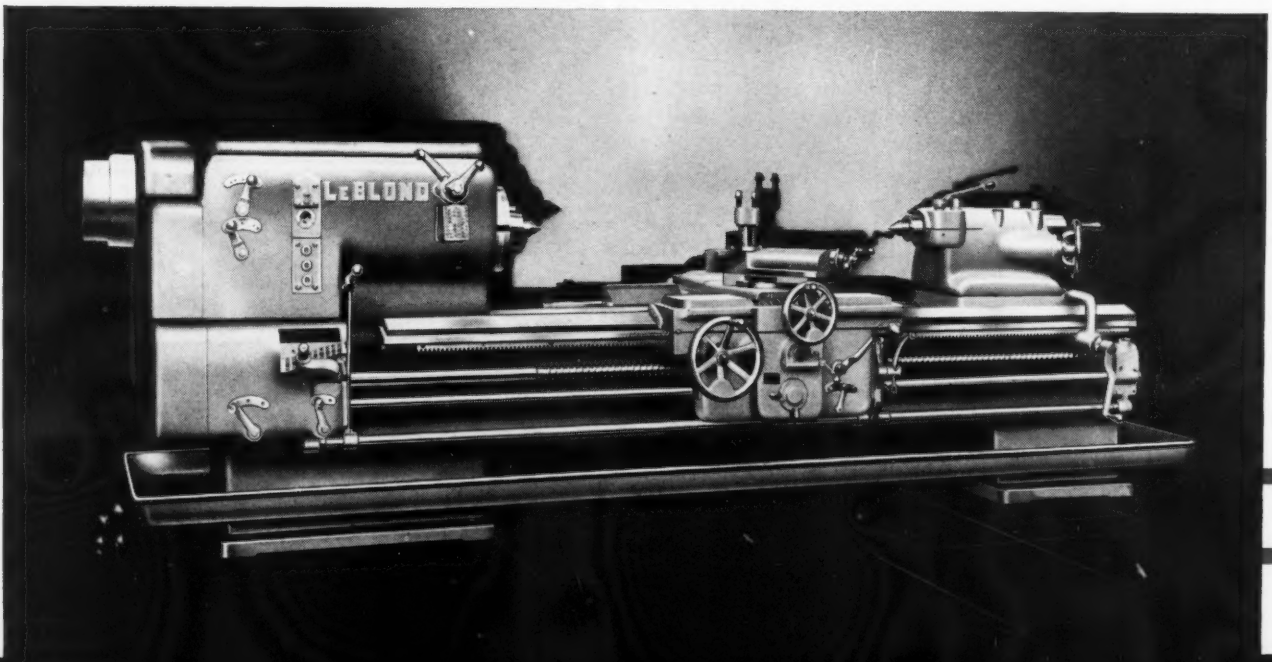
### Booth 507

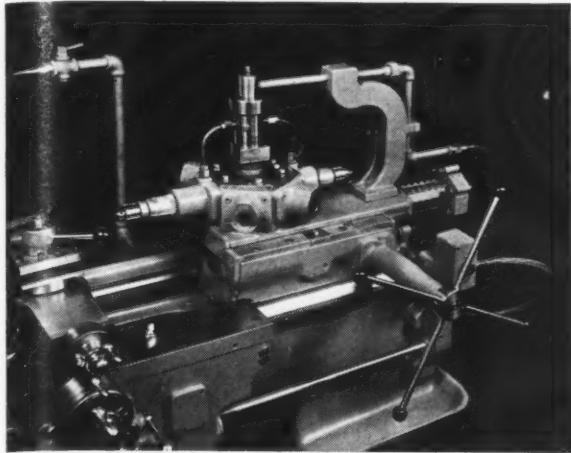
Two heavy-duty lathes, designed by the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio, both of which have simplified controls and an automatically lubricated quick-change gear-box, will be on display. The smaller of the two units, shown in Fig. 1, is a 16-inch Model RT lathe which is available either with a combination gear-belt drive and single-lever control headstock or with a variable-speed headstock. The single-lever control machine has sixteen spindle speeds ranging from 20 to 1025 R.P.M. or from 30 to 1537 R.P.M.; the swing over the ways is 25 inches, and the distance

between its centers is 59 inches. The quick-change gear-box, which is totally enclosed and automatically lubricated, is equipped with heat-treated gears mounted on anti-friction bearings, and provides sixty changes of feeds and threads without change-gears. In addition, the lathe is equipped with an electrically controlled rapid traverse that moves the carriage, cross-slide, and tailstock. A single lever on the apron controls all movements of the carriage and cross-slide, and a plunger on the carriage contacts the tailstock to move it in either direction—to the right or left.

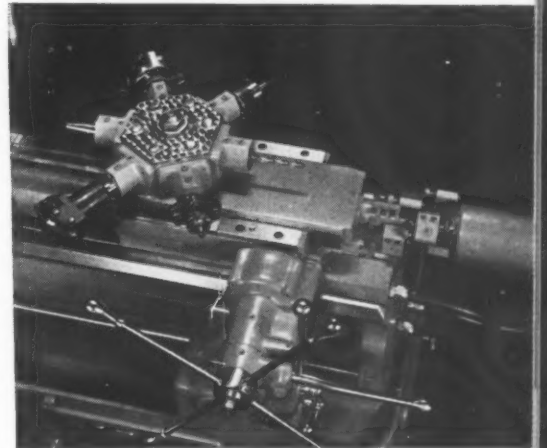
The 16-inch model with variable-speed headstock is similar in construction, but offers a virtually unlimited number of spindle speeds ranging from 6 to 1500 R.P.M.

The second of the two units, shown in Fig. 2, is a 25-inch heavy-duty engine lathe with a distance between centers of 72 inches. The quick-change box has steel gears throughout; the sliding gears are mounted on splined shafts, and the quadrant gear on anti-friction bearings. Forty-eight changes of feed and threads may be obtained without change-gears by setting a tumbler. An additional lever provides for engaging and disengaging the lead-screw. Sixteen spindle speeds, ranging from 6.5 to 400 R.P.M. or from 10 to 600 R.P.M., are available.





**Fig. 1. (Left) Monarch 10-inch Manufacturing Lathe Equipped with High-speed Air Drills in Two of its Six Turret Stations**



**Fig. 2. (Right) Electronic Speed and Feed Controls are Salient Features in the New Speedi-Matic Hand Screw Machine**

## ***Monarch Manufacturing Lathe, Screw Machine, and Electronic Sizing Control***

**Booth 208**

A 10-inch precision manufacturing lathe, with a turret equipped to operate high-speed air drills in two of its six stations, and a Speedi-Matic hand screw machine with electronic controls are two of the new machines to be demonstrated by the Monarch Machine Tool Co., Sidney, Ohio.

The manufacturing lathe, basically a high-speed production machine capable of handling up to 7/8-inch round stock, has been designed to accommodate a variety of tooling. It can be equipped with a carriage and apron or with an anti-friction bearing cross-feed slide. This slide is used for such

operations as forming, knurling, necking, and cutting off; it is designed for rapid approach in both directions and automatic return to center. The two turret stations arranged for the high-speed air drills are 180 degrees apart. Only one hole is drilled in the part being produced, the tooling making possible a duplicate cycle in one complete rotation of the turret.

To permit the faster handling of certain types of work, a power feed turret has been provided with automatic indexing on each return stroke.

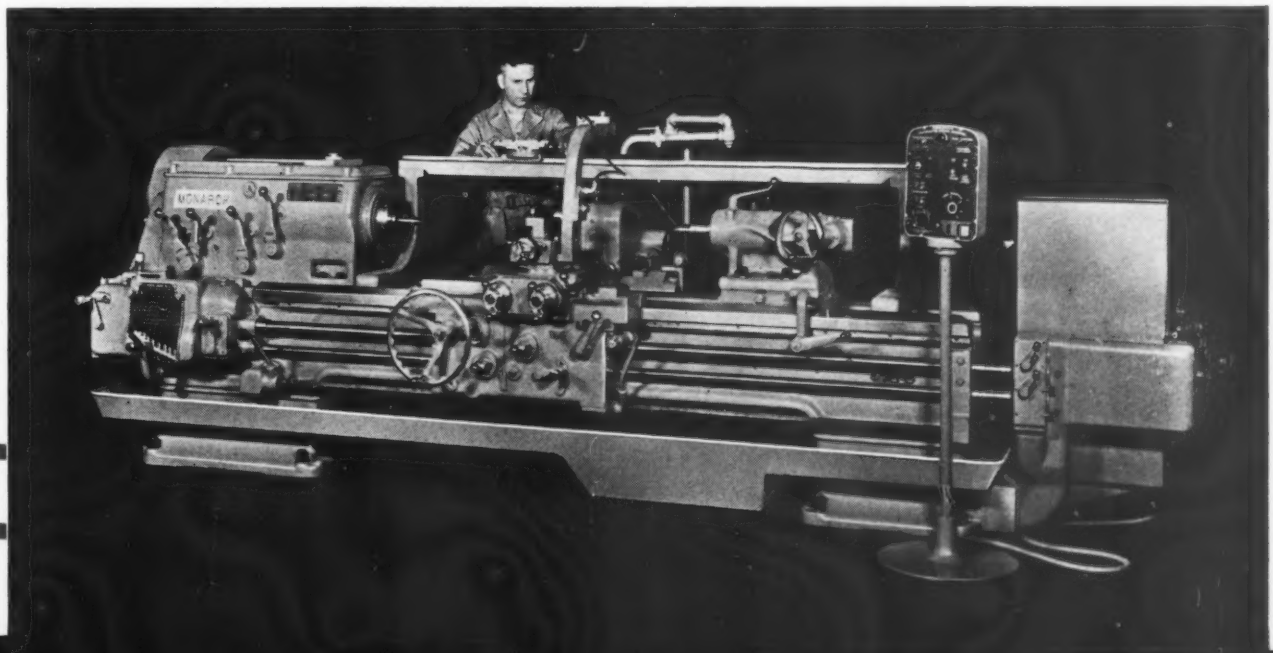
An all-electric drive, complete with motor-generator set, is used

to drive the new machine. It gives a 100 to 1 range of gearless, stepless spindle speeds, forward and reverse. Any one of four different speed ranges can be provided, the top speed in each range being 2500 R.P.M., 3000 R.P.M., 3500 R.P.M., and 4000 R.P.M.

The new Speedi-Matic high-production hand screw machine is equipped with an automatic electronic system for selecting and controlling speeds and feeds. This makes it a simple matter to employ as many as nine different speeds and six different feeds for each job if required.

Other advantages inherent in the new electronic speed and feed control are: (1) Both speed and feed remain practically constant, as set, regardless of load variations; (2) higher motor torque available at the lower speeds and

**Fig. 3. Monarch Engine Lathe Equipped with Automatic Electronic Sizing Control**



feeds permits full cutting tool efficiency when taking heavy cuts on larger diameter work; and (3) the absence of revolving equipment in the power supply to the driving motor minimizes vibration at all speeds.

The power-feed ram type turret with which the Speedi-Matic is equipped permits the correct feed to be repeated for every piece. Each tool is presented to the work manually, power feed is applied to the turret-slide, and at the conclusion of the cut, the tool is withdrawn manually. This keeps tool traverse time down to a minimum. The electronically controlled feed motor eliminates the need of a gear-box, and makes available an infinite number of feeds from 1/8 inch to 16 inches per minute.

Inasmuch as the Speedi-Matic has such a wide range of spindle speeds, it is equally adaptable for chucking operations on work larger than the 7/8-inch maximum round stock capacity of the collet attachment.

Also newly developed is an electronic sizing unit, by means of which a standard engine or tool-maker's lathe can be converted from manual to automatic operation for step-shaft turning, boring, facing, or contour turning. Size control is by means of diameter gage-blocks, micrometer gage-blocks, or a templet. Separate feed motors, electrically controlled, supply power for the length and cross feeds, both of which can be varied from 1/2 inch to 20 inches per minute.

The work-holding chucks are of the two-jaw, self-centering type. A small compressed-air motor near the operator rotates a screw on the chucks to open and close them quickly. Control of the machine is all electric. The operator's pilot switches are on a 110-volt circuit, and all control switches are in a separate dust-proof cabinet away from the machine. These controls make it possible to index the table and lock it accurately or jog it part way for setting up and changing tools. The indexing can either be completely automatic or under the control of the operator.

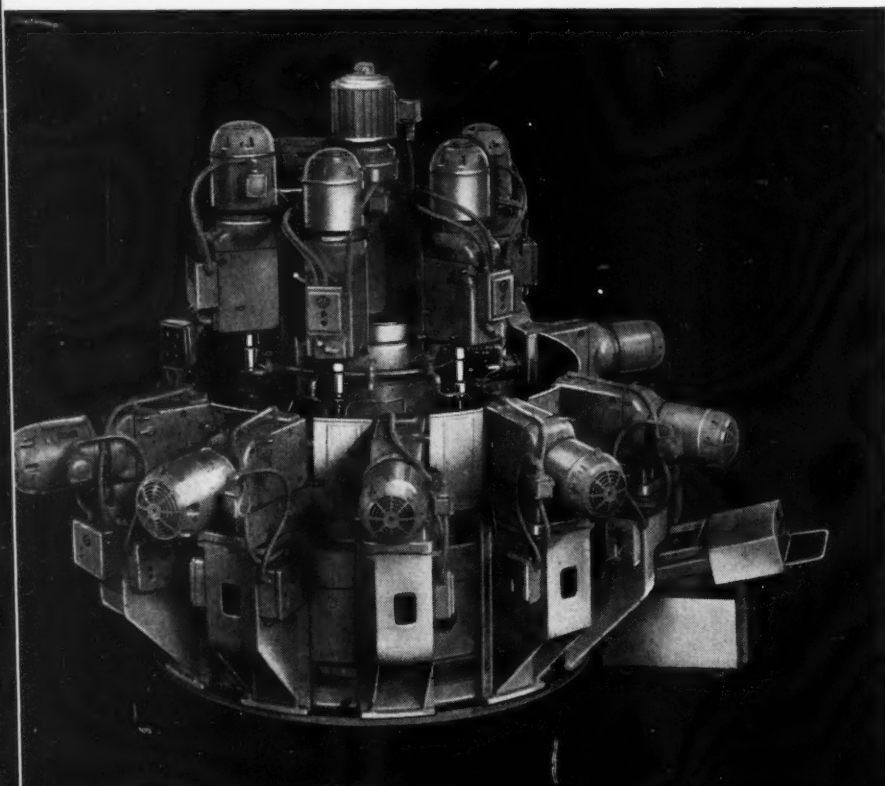
The second machine will demonstrate combined operations on a typical high-production job. It will drill, spot-face, counterbore, mill, ream, and tap brass heat-regulator forgings at the rate of seven pieces per minute. Twelve standard automatic units drive sixteen spindles. Two of the units have multiple-spindle auxiliary heads, one unit has a standard milling attachment, and another has a special recessing tool. The machine has a 26-inch automatic indexing table with ten identical fixtures and a standard base 80 inches in diameter. An air system prevents the table from indexing while any unit is working and trips every head the instant the table has indexed to position.

## *Kingsbury Automatic Indexing Machines*

### **Booth 410**

High-production work will be demonstrated at the show by the operation of two automatic indexing machines made by the Kingsbury Machine Tool Corporation, Keene, N. H. One machine, shown in the accompanying illustration, performs twelve operations on three faces of the work. It has twelve automatic units and a 60-inch automatic indexing table

with twelve chucks. Whenever the table indexes, every chuck rotates 180 degrees. In this way, four of the horizontal units can operate on one face of the work and the other four horizontal units on the opposite face. Four vertical units on a central column perform work on the third face of the part. The chucks rotate in a harmonic motion, starting and stopping slowly.



*Automatic Indexing Machine Made by the Kingsbury Machine Tool Corporation that Performs Twelve Operations on Three Faces of the Work*

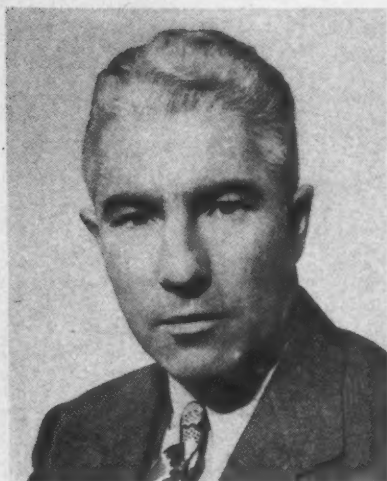




*Men Responsible for Results  
in the Machine Tool Using Industries*



Winfred C. Rodger, Works Manager, Syracuse Plant, L. C. Smith & Corona Typewriters, Inc.



H. C. Gunetti, General Manager, Sunnyvale Works, Westinghouse Electric Corp., Sunnyvale, Calif.



Raymond D. Baker, Master Mechanic, Bay Manufacturing Div., Electric Auto-Lite Co., Bay City, Mich.



George W. Drysdale, General Manufacturing Manager, Briggs Mfg. Co., Detroit, Mich.



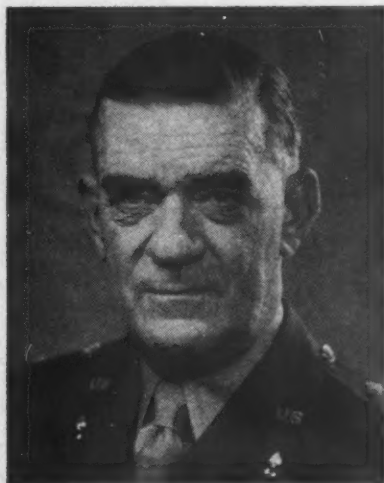
W. J. Secor, Superintendent, The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.



J. G. Johnston, General Manager, International Business Machines Corporation, New York, N. Y.



W. H. Rietz, Vice-President, Production and Engineering, Ilg Electric Ventilating Co., Chicago, Ill.



Major General E. S. Hughes, Chief of Ordnance, War Department, Washington, D. C.



James F. Maguire, Superintendent of Production, Watertown Arsenal, War Department, Watertown, Mass.

*Men Responsible for Results  
in the Machine Tool Using Industries*



Captain Max Schreiner, U. S. N.,  
Shop Superintendent, Norfolk  
Naval Shipyard, Portsmouth, Va.



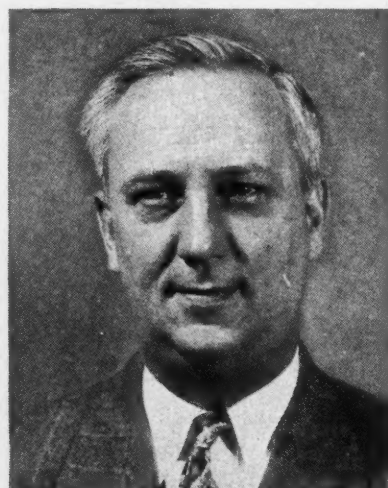
Norman Johnson, Manager, Freight  
Car Plants, Pullman-Standard Car  
Mfg. Co., Chicago, Ill.



Lewis W. Metzger, Vice-President  
Operations, Eddystone, Pa., Divi-  
sion, Baldwin Locomotive Works



L. C. Shippy, Tool Superintendent,  
Harrison Radiator Div., General  
Motors Corp., Lockport, N. Y.



F. M. Prucha, Supt., Methods and  
Equip. Div., Cadillac Motor Car  
Div., General Motors Corp., Detroit



Clay P. Bedford, Vice-President,  
Manufacture, Kaiser-Frazer Cor-  
poration, Willow Run, Mich.



W. F. Ehrick, Plant Manager  
of the Huber Manufacturing  
Co., Marion, Ohio



H. F. Sacknus, Factory Manager,  
Pittsburgh Equitable Meter Div.,  
Rockwell Mfg. Co.

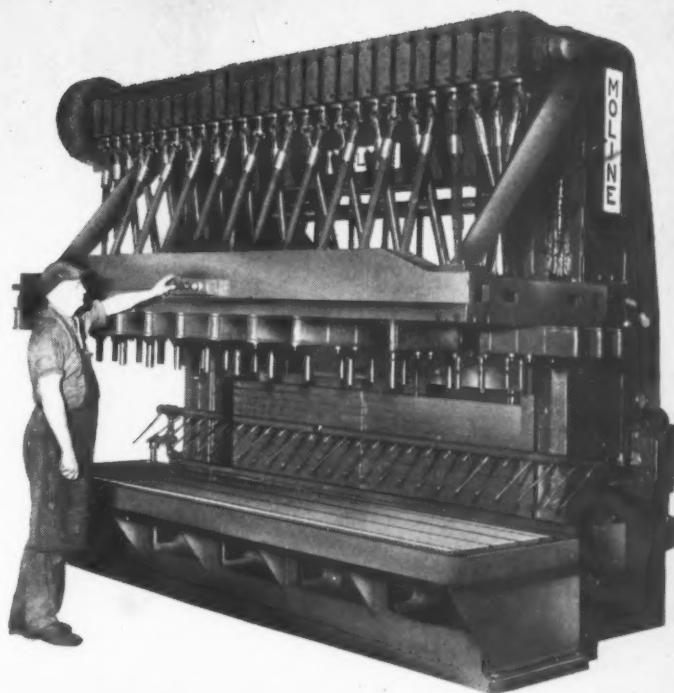


A. J. Langhammer, President,  
Amplex Div., Chrysler Corpora-  
tion, Detroit, Mich.





**Fig. 1. Moline Universal-joint Type Drilling Machine Having Ten Drilling Heads — One of the Latest Additions to the "Hole Hog" Line**



## "Hole Hog" Drilling and Boring Machines

Booth 128

One of the improved "Hole Hog" line of machines to be displayed by the Moline Tool Co., 100 Twentieth St., Moline, Ill., is the HU68 universal joint type drilling machine shown in Fig. 1. This machine, which has a drilling area of 6 feet by 24 inches, is equipped with ten drill heads, driven through universal-joint spindle arms. The combination of adjustable drill heads and adjustable top drivers along the driving spiral makes it possible to set the drills at any point in the drilling area with a minimum angle of operation for the universal joints. Hydraulic rail feed and an auto-

matic machine cycle with push-button control are also provided.

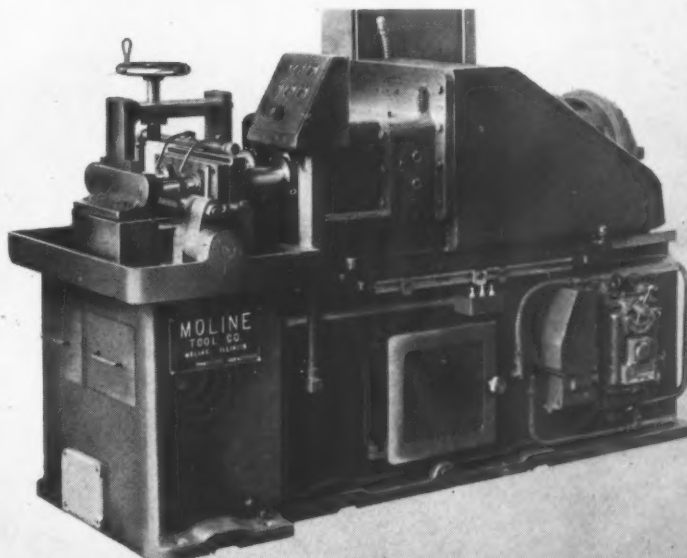
A two-spindle horizontal machine—MR127—arranged to drill the holes in the ends of railroad track sections for splice bars or "fish plates" is shown in Fig. 2. The machine is provided with a fixture that can be adjusted to accommodate various rail sizes. The spindles, on 6-inch centers, advance hydraulically in rapid traverse, feed the drills through the work, and withdraw to starting position in rapid traverse. The cycle of the machine is automatic, and is controlled by push-buttons.

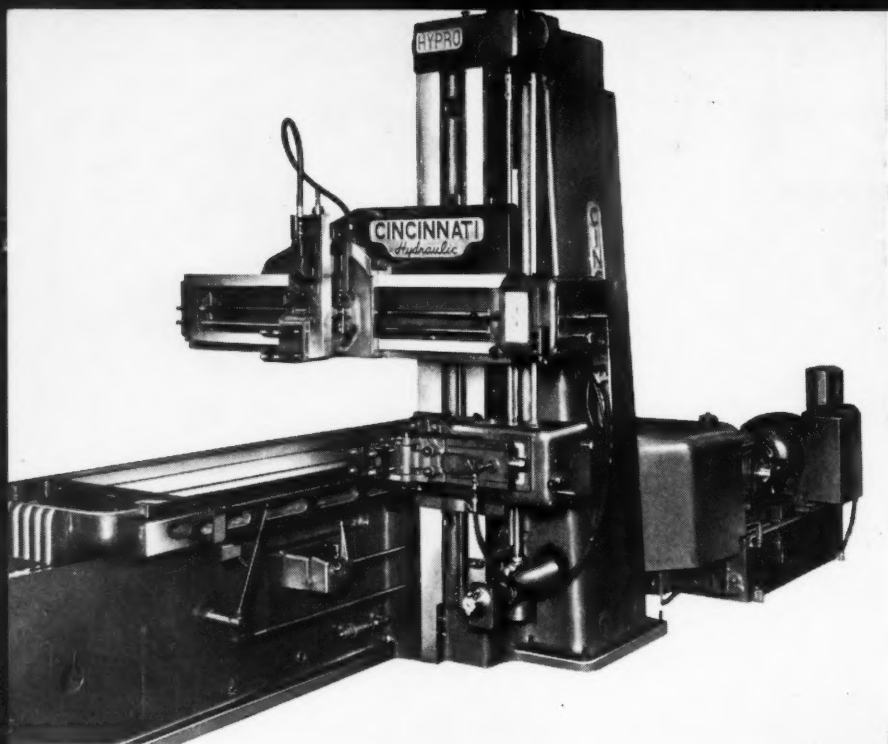
Hydraulic feed to the table and

automatic jump feed for such operations as pipe drilling are features of the HF9 straight-line drilling machine also to be displayed. This machine has a spiral drive to twenty-two drill heads, which can be adjusted for spacing along the length of the spiral.

A precision cylinder boring machine equipped with four un-piloted spindles is another of this company's exhibits. This machine (115FB) is equipped with boring heads which automatically retract the single-point tools a few thousandths of an inch when they have passed through the work, thus allowing the tools to be withdrawn without scoring the bores. Shifting of the work away from the tools or stopping the rotation of the spindles is not necessary.

**Fig. 2. Horizontal Way Type Drilling Machine Made by Moline Tool Co. for Drilling Holes in Railroad Track**





## Cincinnati "Hypro" Planer, Boring Mill, and Milling Machine

Booth 220

The 30-inch by 30-inch by 8-foot "Hypro" hydraulic planer shown in Fig. 1 is a completely new machine that has just been added to the line of machine tools made by the Cincinnati Planer Co., Cincinnati 9, Ohio. This machine was developed for use in tool-rooms, maintenance departments, and other applications where small planers are suitable.

The planer is driven by a new type, 20-H.P. hydraulic unit with Hypro finger-tip remote control for infinite adjustment of table speeds, and is equipped with two rail-heads and one side-head. A

new type hydraulic feed mechanism and shockless hydraulic tool-lifters are other features.

The electronic head and table drive furnished on the 48-inch by 48-inch by 12-foot planer type milling machine, Fig. 2, is a new development in the planer-miller field. With this type drive, it is possible to increase or decrease head or table feeds while cutting by conveniently placed direct-reading speed-control dials in a pendant station. From this centrally located, movable pendant station, it is possible to change from feed to traverse or to in-

Fig. 1. "Hypro" Hydraulic Machine Developed for the Small Planer Field by the Cincinnati Planer Co.

crease or decrease feeds without gear changes, clutches, etc. Engagement of the side-head feed or traverse is through push-button magnetic type control.

Automatic spindle load control with feed tachometers provide an added feature to aid productive capacity. Feed rates are automatically changed to suit various width surfaces and to maintain constant horsepower, so that full capacity of the machine will be utilized at all times.

The transmission of power to the table is through a newly designed combination herringbone and cone worm-wheel drive that provides an anti-backlash self-locking unit without side thrust. Four newly designed Hypro dual-purpose 40-H.P. milling heads provide the necessary speed and power for both high-speed and carbide-tipped milling cutters. The features of this new planer-miller permit the machining of irregular contours not easily handled on conventional type machines.

A 50-H.P., single-shift, variable voltage drive is an outstand-

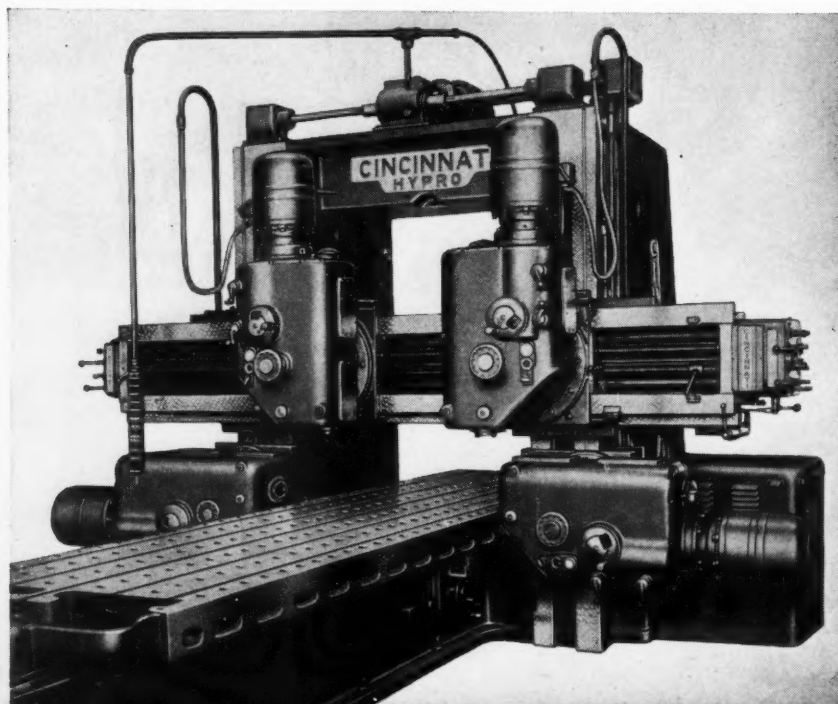
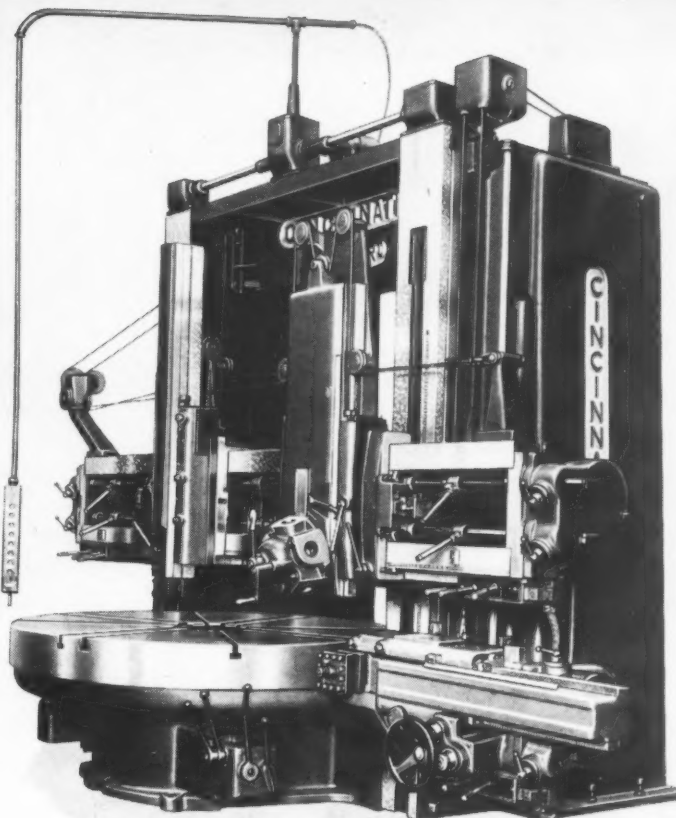


Fig. 2. Cincinnati Planer Type Milling Machine Equipped with New Electronic Head and Table Drive

**Fig. 3. (Right) "Hypro" Vertical Boring and Turning Mill Equipped with a Single-shift, Variable-voltage Drive for Wide Speed Selection**

**Fig. 4. (Below) 48-inch by 48-inch by 16-foot Double-housing Planer Made by the Cincinnati Planer Co.**



ing feature of the 6-foot vertical boring mill shown in Fig. 3. A wide range of speeds is obtained through a push-button control without gear changes in the high and low speed ranges. In facing large-diameter work, a constant cutting or facing speed can be maintained electronically, regardless of the decrease in diameter of the work as the tool progresses toward the center of the table. The operator can read the table speed from electrical tachometers in the pendent station.

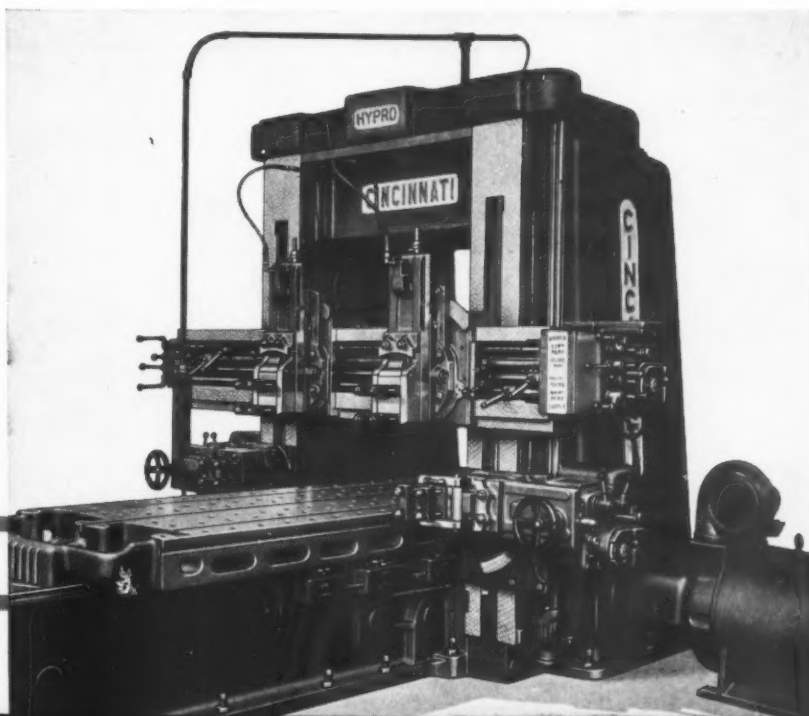
This machine is equipped with a new type table track in the form of a large anti-friction bearing that eliminates heat due to friction and therefore permits higher speeds. More accurate and uniform work is thus produced. This feature also eliminates bed and table track scoring. The machine is equipped with one left-hand ram type rail-head, one right-hand turret type rail-head, and one right-hand side-head.

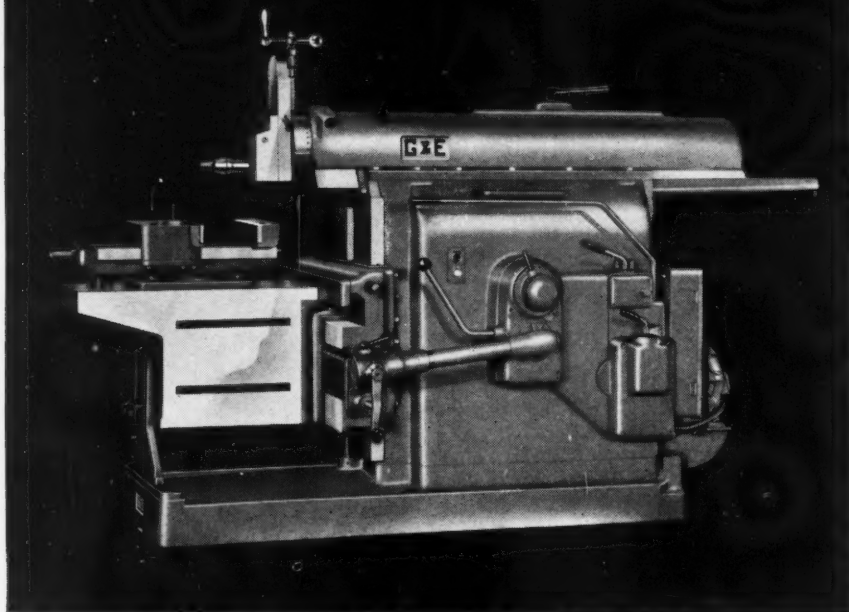
The 48-inch by 48-inch by 16-foot double-housing planer shown in Fig. 4 is provided with a 35-H.P. variable-voltage motor drive

that gives a wide range of table speeds for planing with high-speed or carbide-tipped tools. An electrical table speed indicator in the pendent station, reading in feet per minute, provides the operator with a means of accurately setting the table speeds for the most efficient use of the cutting tools.

New mechanical features of this planer include a positive magnetic clutch type quick-acting feed mechanism, narrow guide-rail construction, extended saddle sup-

ports, dual saddle and slide controls, inverted-dovetail construction down-feed slides, double cross- and down-feed nuts, twin helical gear drive, and renewable T-slot inserts. Shockless pneumatic tool-lifters maintain uniform acceleration and deceleration, with soft receding action of the tool-block. A new Hypro hydraulic safety table stop and jack is designed to stop the table quickly in case of control failure with a uniform decelerated motion and without severe shock.





## LATEST PRODUCTION

**Fig. 1. Gould & Eberhardt 32-inch Industrial Shaper with Sixteen Speeds and an All-helical Gear Drive**

### *Gould & Eberhardt Shapers and Gear-Hobbing Machines*

**Booth 41**

An all-helical gear drive and sixteen ram speeds are new developments incorporated in the line of shapers to be exhibited by Gould & Eberhardt, Inc., Irvington 11, N. J. The ram speeds are quickly selected by two gear-shift levers. Arranged in geometric progression, the sixteen speeds provide a wide range of strokes to suit all classes of work. Eighteen changes of feed are available.

All major components of the shapers are made of high-strength Meehanite castings. A circulatory pressure system of lubrication provides a continuous supply of oil automatically.

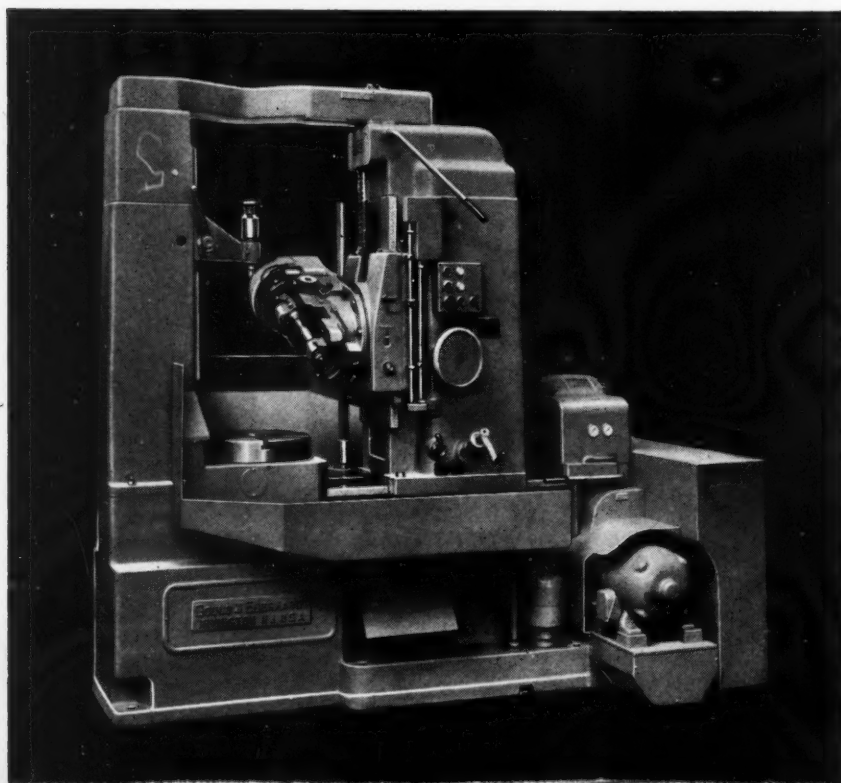
Electrified, push-button operated gear-hobbers—the 24H size being shown in Fig. 2—were developed for cutting spur, helical, and worm gears by the in-feed method, and for hobbing splines or worms with low numbers of teeth. These machines are regularly furnished for both conventional hobbing with down feed, and for climb hobbing.

The hob-spindle differs from conventional design, having a tapered bronze sleeve shrunk onto the spindle to rotate within a stationary hardened bushing. Standard screws for these machines are cut within a maximum accumulated

lead error of 0.001 inch in 48 inches. Hob speed, index, feed, and lead change-gears, all contained within an oil-tight compartment, have been made more accessible.

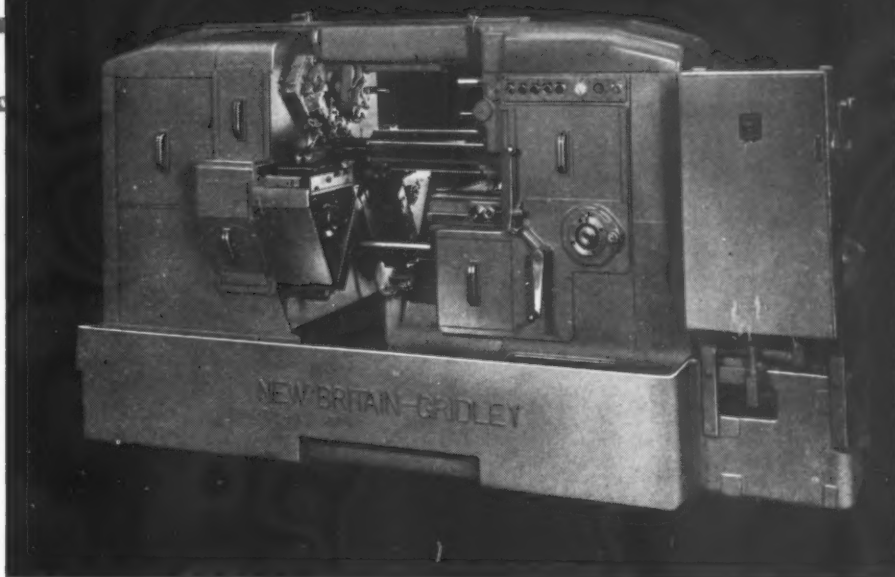
A circulatory pressure system of lubrication supplies oil continuously to the main gear-case and directly to the work-spindle and index worm-gear set. A high-pressure metered system has been added to lubricate the entire hob-slide and stanchion units, including the hob-spindle and the hob end bearing.

A special hob swivel head arranged with a worm and gear drive to the hob-spindle has been developed as an attachment for all size machines. An over-arm to the work support is also available. A tangential worm-gear cutting attachment for the large size machines provides for the hobbing of single- and multiple-thread worm-gears, using hobs or fly cutters. All machines can be equipped with a cam in-feed mechanism especially designed to feed the hob into the work at a predetermined variable rate.



**Fig. 2. Improved Universal Manufacturing Type Gear-hobbing Machine to be Exhibited by Gould & Eberhardt**

**Fig. 1. New Britain Multiple-spindle Automatic Screw Machine Made in 1 1/4- and 2 1/4-inch Sizes**



## ***New Britain Automatic Screw Machines and Turret Lathes***

**Booth 311**

A new line of multiple-spindle automatic screw machines will be shown by the New Britain-Gridley Machine Division of the New Britain Machine Co., New Britain, Conn. The improvements made in these machines allow quick set-up and change-over, the full utilization of carbide tooling, interchangeability of tools, and automatic operation. The new automatic screw machines are available in 1 1/4-inch and 2 1/4-inch sizes, the smaller size machine being shown in Fig. 1.

Six independently cammed cross-slides are arranged radially about the axis of the spindle-carrier, making possible the same line of forming thrust for every position, minimizing overhang, and allowing interchangeability of holders among the five forming positions. The time for cam changes has been practically eliminated. No cam changes are required for a change in stock feed length. A

universal tool-slide cam eliminates cam changes for the main tool-slide. By adjusting a calibrated dial, any ratio of feed to approach can be obtained without changing the high point or drawback point. Therefore, tool-holders need not be repositioned. Cross-slide cams are interchangeable among the five forming positions, and are contained within the cross-slide mounting. Ten cams cover the majority of jobs.

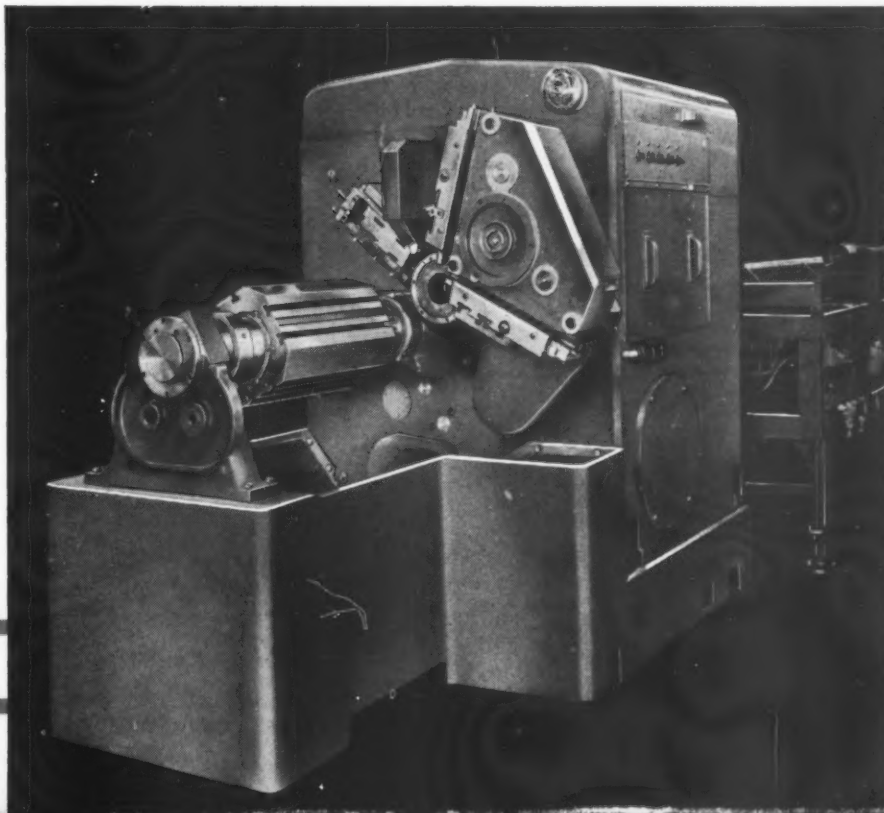
A program wheel indicates the high point and drawback of all cross-slides and the main tool-slide, and the high- and low-speed

cycle of the machine. From this wheel, the high- and low-speed dogs may be changed. Manual unchucking is possible in any position. The feeding mechanism can be cut out when desired.

A new line of automatic turret lathes (Fig. 2) will also be exhibited. These machines were developed for the full use of carbide tools and for quick change-over from job to job. The 5-inch capacity machine in this line has a speed range up to 1000 R.P.M. The main turret operates independently of the cross-slides.

The turret operating cam is electrically controlled, so that by simply adjusting a dial, an infinite variation of feed is possible in each turret station without changing any turret cams. A full rev-

**Fig. 2. Automatic Turret Lathe Developed for Quick Change-overs by the New Britain Machine Company**



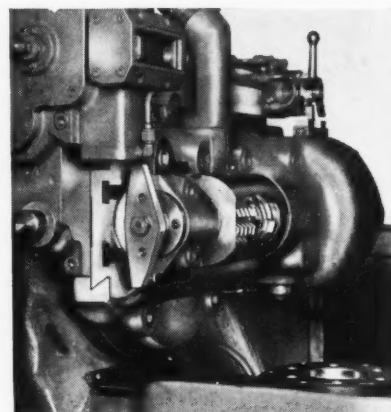
olution of the turret cam is used for each face position of the turret, the differences in feed being obtained by varying the camshaft speed. The effect of a double-rise cam can also be obtained.

The two forming slides are provided with micrometer adjustments. The bracket on which they are mounted contains the disk type forming cams. Two cut-off slides allow the use of the double cut-off method.

Quick change-over is easily accomplished, since the turret cam need never be changed. Where similar work, varying only in size,

is being produced, a set of standard cams with enough rise for the longest forming and cut-off jobs is provided. A variable high-speed approach then compensates for different depths of cut. A new air-feed device eliminates the need of stock pushers and conventional stock reel.

The Model 365 double-end, tool-rotating, chucking machine described in August *MACHINERY* will also be displayed. The Models 26-36 and 27-37 precision boring machines, also described in that issue, will complete the New Britain exhibit.



## Barber-Colman Automatic Hob-Sharpening Machine and Hob-Shifter

Booth 523

The new No. 6-5 automatic hob-sharpening machine shown in Fig. 1, developed by the Barber-Colman Co., 109 Loomis St., Rockford, Ill., for sharpening high-speed steel for carbide-tipped hobs and form cutters incorporates a number of important improvements as the result of a user survey.

The accuracy of settings provided and the precise operation of the machine minimize inspection and regrinding for correction. This machine will hold adjacent

spacing within 0.0001 inch and non-adjacent spacing within 0.001 inch. For helical gash angular setting, there is a vernier on the sine-bar mounting plate and one-minute graduations on the hand adjustment dial which permit accurate lead settings. Precise positive or negative rake settings permit alignment on straight gashed work within 0.0001 inch. Rake errors on helical gashed work can be held to 0.001 inch on many classes of work. Dual torsional expanding spring tension removes

all backlash between the sine-bar and the wheel-spindle. A micro-inch finish of from 10 to 20 can be obtained.

Hobs 6 inches in diameter and 5 inches long with a minimum lead of 8.5471 inches can be handled with a 40-degree sine-bar setting. Feeds (at 3 inches diameter) range from 0.00015 to 0.0009 inch in 0.00015 inch steps. Index-plates are available to handle any number of gashes from three through thirty-three. Adjustable spindle speeds include 3600, 4300, and 5000 R.P.M. The adjustable hydraulic table permits approximately five to twenty cycles per minute, while the length of stroke can be adjusted from 3 through 8 inches.

An automatic hob-shifter (Fig. 2), for use on the Barber-Colman No. 8-10 vertical cycling production hobbing machine automatically shifts the hob to a new cutting position after each cutting cycle. Operating from the same hydraulic oil that actuates the machine cutting cycle, the attachment shifts the hob a predetermined amount, between 0 and 0.450 inch, at the completion of each cycle. After the hob has been shifted the entire length of the cutting face, the automatic shifter reverses its direction. This attachment insures that no hob life will be sacrificed in sharpening, since all hob teeth are worn equal amounts. Also, a considerable amount of machine "down time" and operator attention is obviated.

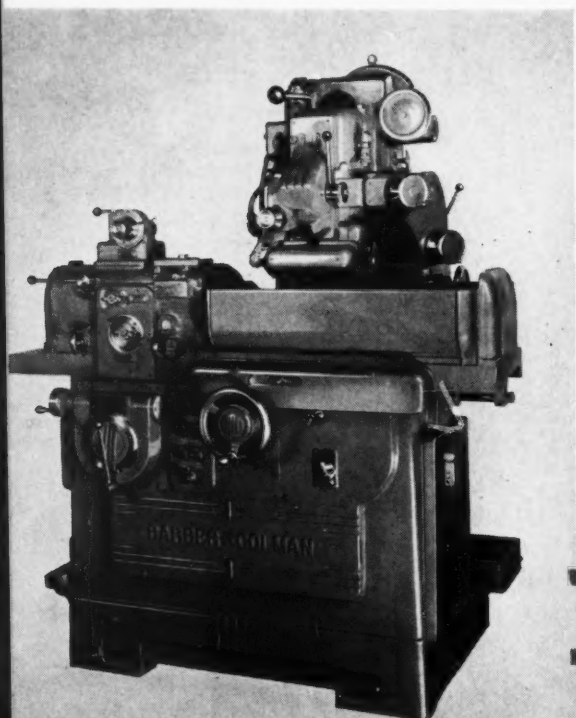


Fig. 1. (Left) Barber-Colman Precision Automatic Hob-sharpening Machine

Fig. 2. (Above Right) Automatic Hob-shifter for Use on the Barber-Colman Vertical Cycling Production Hobbing Machine





*Men Responsible for Results  
in the Machine Tool Using Industries*



F. Penn Holter, Works Manager,  
Lockheed Aircraft Corporation,  
Burbank, Calif.



J. J. Dewey, General Factory  
Manager, American Laundry Ma-  
chinery Co., Cincinnati, Ohio



James A. Carter, Machine Shop  
Superintendent, Pitney-Bowes,  
Inc., Stamford, Conn.



John W. Anderson, Vice-President,  
Manufacturing, Schwitzer-Cummins  
Co., Indianapolis, Ind.



Lloyd F. Harrison, General Super-  
intendent, Engine Div., Kaiser-  
Frazer Corporation, Detroit, Mich.



P. H. Curtiss, Sr., General  
Superintendent, Buda Co.,  
Harvey, Ill.



John W. Craig, Works Manager,  
The Crosley Corporation, Rich-  
mond, Ind.

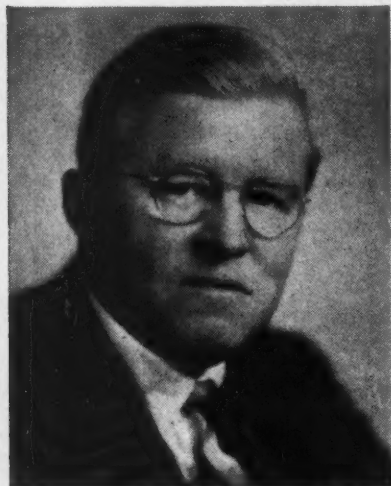


Edward N. Haas, Works Manager,  
Independent Pneumatic Tool Co.,  
Aurora, Ill.



Vice-Admiral G. F. Hussey, Jr.,  
U. S. Navy, Chief, Bureau of Ord-  
nance, Navy Dept., Washington

*Men Responsible for Results  
in the Machine Tool Using Industries*



T. I. S. Boak, Works Manager, Winchester Repeating Arms Co., Div., Olin Industries, New Haven, Conn.



D. J. McAvoy, Plant Manager, Grabler Mfg. Co., Cleveland, Ohio



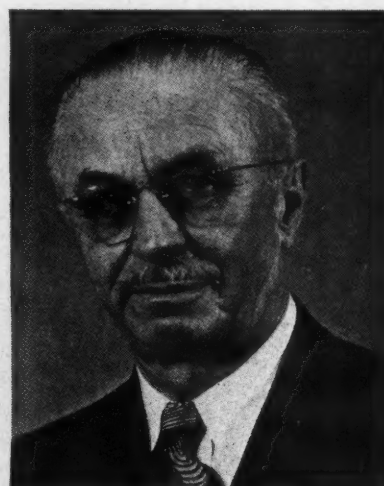
L. F. Remington, Works Manager, Thomson-National Press Company, Franklin, Mass.



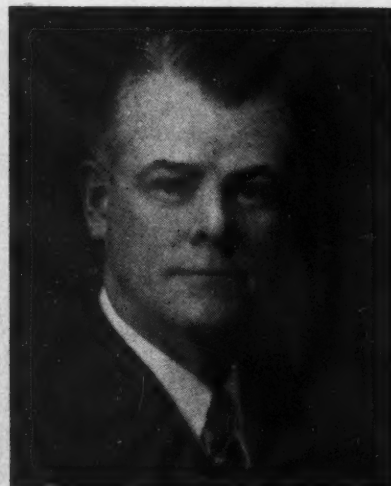
George H. Koskey, Works Manager, Battle Creek Bread Wrapping Machine Co., Battle Creek, Mich.



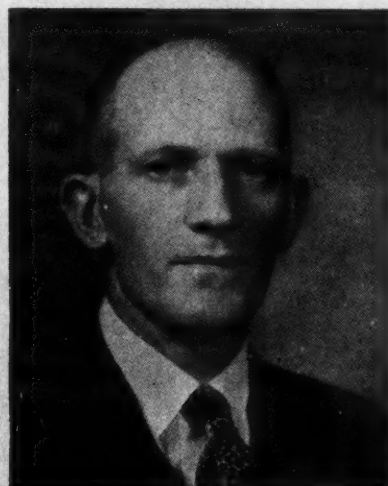
Guy R. Reed, Plant Superintendent, Automatic Transportation Co., Chicago, Ill.



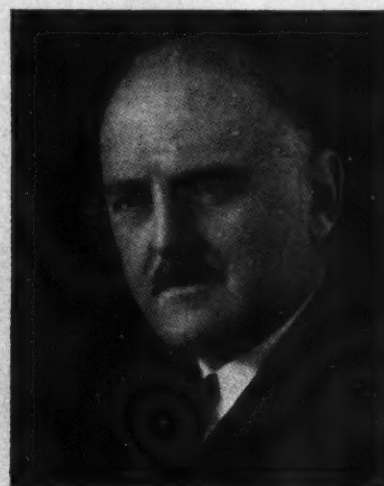
E. H. Meyers, Mechanical Superintendent, Western Cartridge Co., Div., Olin Industries, East Alton, Ill.



Gordon Lefebvre, President and General Manager, The Cooper-Bessemer Corp., Mount Vernon, O.



E. E. Griffiths, Consulting Manufacturing Engineer, Westinghouse Electric Corporation, Pittsburgh



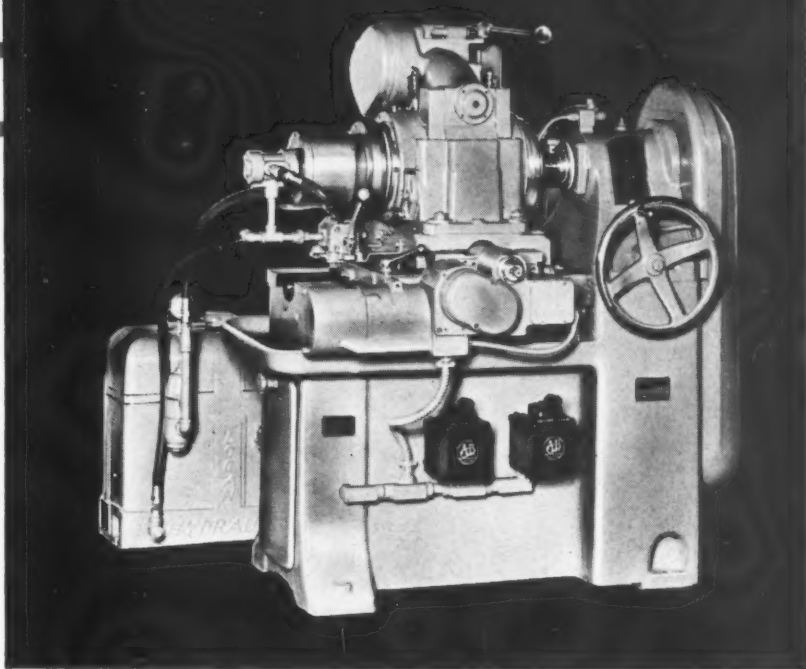
William Balderston, Executive Vice-President, Philco Corporation, Philadelphia, Pa.





Fig. 1. (Below) Lees-Bradner Ultra-speed Gear-hobber Designed to Use Carbide Hobs

Fig. 2. (Right) Thread Milling Machine Built by Lees-Bradner Co., with Provision for Automatic Cycling



## Lees-Bradner Ultra-Speed Gear-Hobbers and Improved Thread Milling Machine

Booth 111

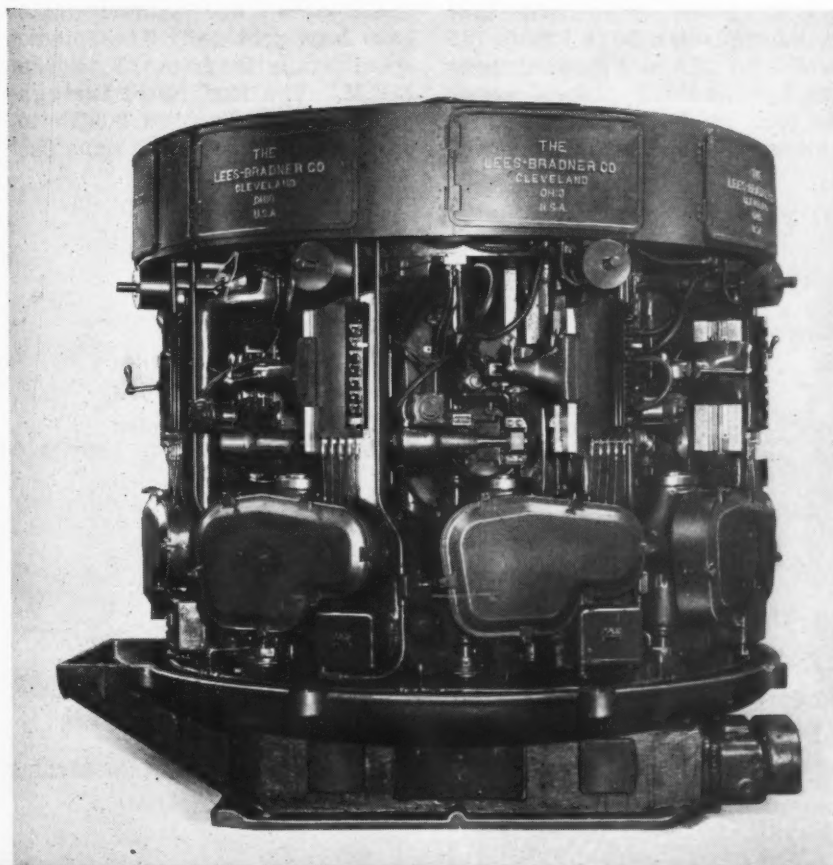
The Lees-Bradner Co., Cleveland, Ohio, will display an eight-spindle rotary gear-hobber—one of a line of ultra-speed gear-hobbers—designed and built for use with carbide hobs. These Model 7-A machines operate at spindle speeds up to 1800 R.P.M., and are built in single- as well as in four-, six-, and eight-spindle rotary types; on the rotary machines,

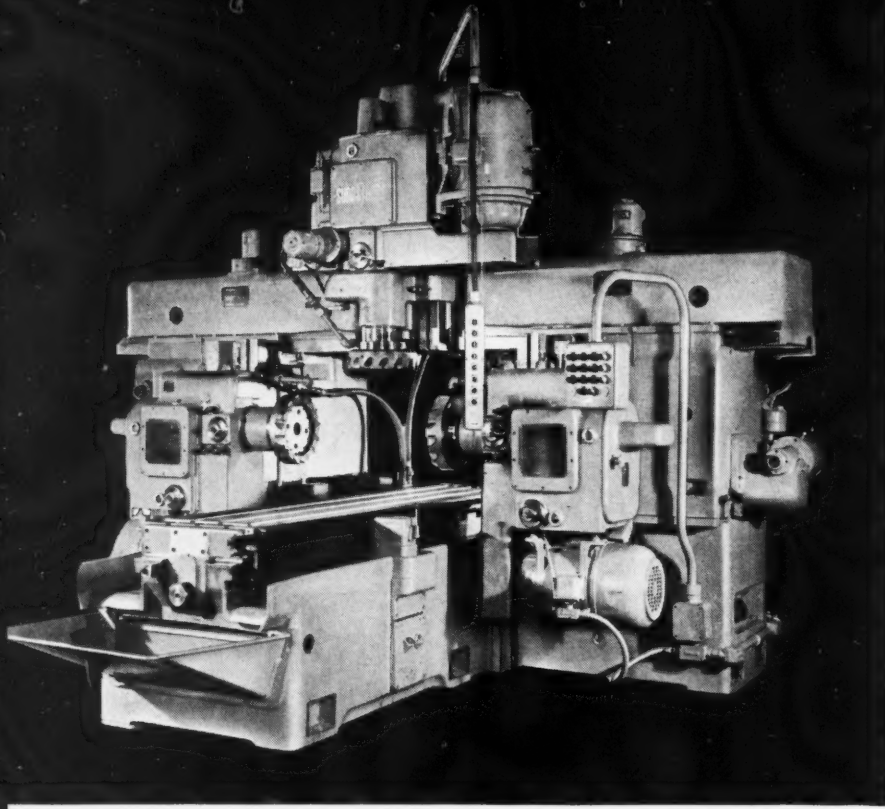
each spindle is capable of being tooled for the same or for a different job, the spindles being completely independent of each other. Push-button controls permit automatic as well as manual operation.

A rapid-traverse differential is provided which eliminates the need for rapid-traverse clutches. The new lead differential head-

stock will also be on display. This unit has been developed to facilitate handling helical gears and to simplify helical gearing calculations. With the new headstock, the index gearing consists only of idlers and a change-gear having the same number of teeth as the number of teeth to be cut in the blank, or a multiple of that number. The feed train consists of idlers and a gear having as many teeth as the number of thousandths of an inch that there are to be in the feed, or a multiple thereof. The lead gearing is determined by dividing the lead of the gear to be hobbled by the number of teeth therein, and then obtaining factors of this number from any factor table.

Two improved thread milling machines will be shown—the Model 40, and the Model HT illustrated in Fig. 2. Both of these machines are semi-automatic in operation. The cutter is automatically brought to the required depth against a positive micrometer stop, fed across the face of the part to be threaded, and withdrawn from engagement with the work. Both machines are equally suited to internal or external thread milling. The Model HT machine, though capable of being arranged with an automatic cycle, is fully universal and will handle both ring or hob type work, as well as single-cutter or disk type thread hobs.





## *Triplex Milling Machine and Sundstrand Automatic Lathes*

Booth 20

The Sundstrand Machine Tool Co., 2530 Eleventh St., Rockford, Ill., will show a large Triplex Rigidmil, the primary application of which is the production milling of both wide and narrow parts without sacrifice in accuracy. This machine has three adjustable 25-H.P. spindle heads, two horizontally opposed, and one in a vertical position. The horizontal spindle heads are carried on traveling columns that have power movement along the column bed ways. The vertical spindle head is mounted on ways and has power

movement and power clamping; the vertical head is carried on a cross-rail that has horizontal ways in the same plane as the machine table, and has power movement and power clamping for positioning the vertical spindle crosswise to the machine table. All three spindles have micrometer quill adjustment for accurate setting.

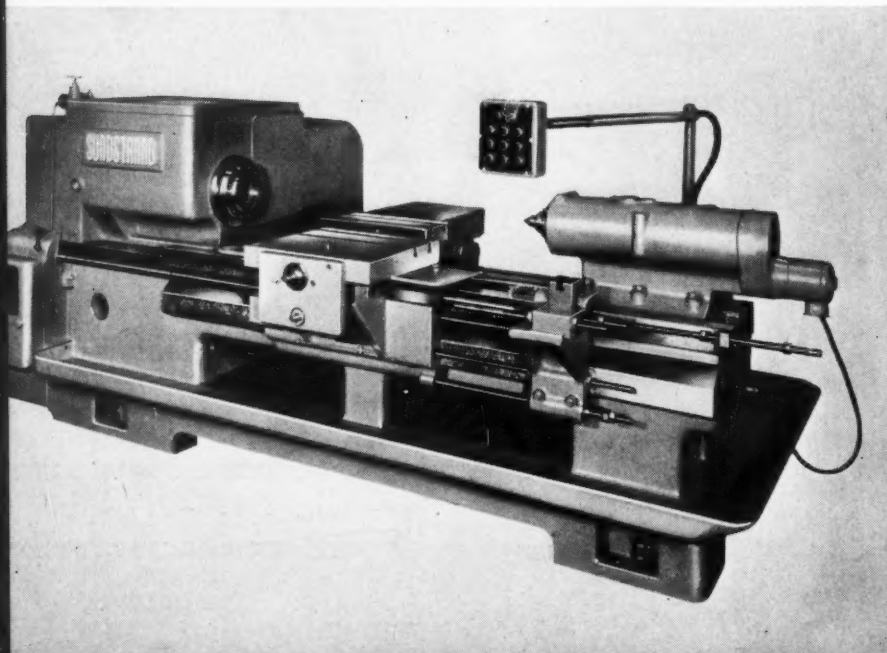
The spindle speed range for each head is in a 30 to 1 ratio (25 to 750 R.P.M.) and speed changes are by means of pick-off gears. As each head is a self-contained unit, spindle speeds can be varied

**Fig. 1. Triplex Rigidmil Designed by the Sundstrand Machine Tool Co. for the Production Milling of Both Wide and Narrow Parts**

independently. Cutters up to 14 inches in diameter can be used on all three spindles.

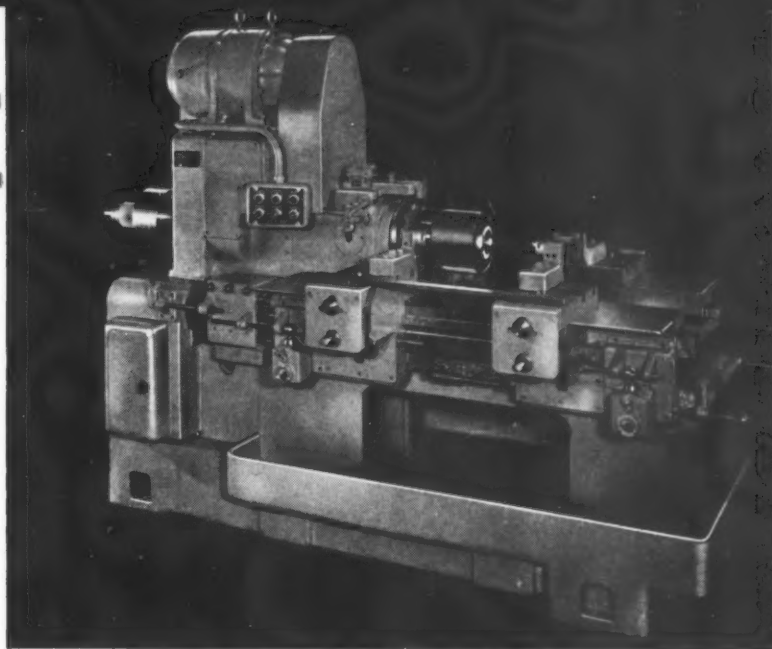
Table feed rate ranges from 1/2 inch to 50 inches per minute, and the rapid-traverse rate is 300 inches per minute. Standard machines are available with table widths of 18, 24, or 30 inches, and feed strokes up to 144 inches, but larger sizes can be furnished if required.

The Sundstrand Machine Tool Co. will also exhibit two new additions to its line of automatic lathes. One—the Model 16 automatic lathe—is equipped with a 75-H.P. spindle-drive motor in order to make full use of carbide tools. On this machine, the spindle motor runs continuously, once the machine is started, as an automatic clutch and spindle brake have been provided. The spindle speed range is from 15 to 750 R.P.M. The feed range through pick-off gears is from 0.0025 to 0.100 inch per revolution. The



**Fig. 2. Sundstrand Automatic Lathe Equipped with a 75-H.P. Motor Drive**

**Fig. 3. Four-slide Automatic Lathe for Machining Electric Motor Stator Frames Developed by Sundstrand Machine Tool Co.**



capacity of the machine illustrated is 60 inches between the headstock and tailstock center, and it has a 17-inch swing over the slides. Other standard bed lengths for a distance between centers of 36 and 84 inches are also available.

The other new automatic lathe has been designed specifically to turn electric motor stator frames. This machine has two front and two rear carriages, so that the rabbet fits in both ends of the stator frames can be machined simultaneously, in very accurate relation to each other. The two front slides carry boring and chamfering tools, and the two rear slides carry facing and chamfering tools.

The standard cycle of tool-slides is rapid approach, feed, rapid return, and stop. If desired, the machine can be provided with an automatic dual cycle, so that at the end of the first rapid return, the complete cycle will be re-

peated, in order to take two cuts over the surfaces.

Still another new machine to be exhibited is a double-end drilling

and centering machine designed to handle work up to 72 inches in length and 1/2 inch to 4 inches in diameter with one set of jaws.

### *Lodge & Shipley 14- and 16-Inch Lathes*

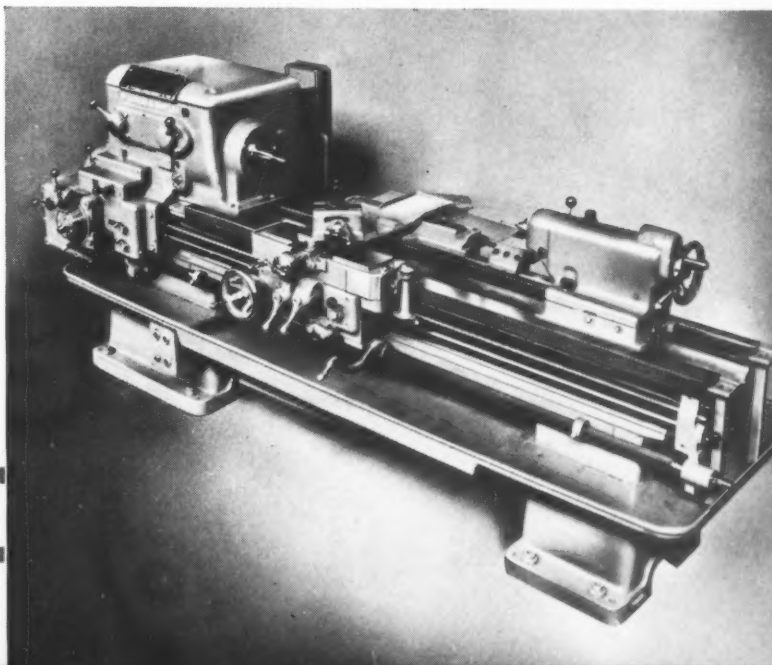
**Booth 312**

The entire line of Model X lathes built by the Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio, will be exhibited in operation at the Show. This line has been modified and extended to include the smaller 14- and 16-inch sizes. These engine, toolmaker's, and manufacturing lathes have a twenty-four-speed headstock, available in three ranges of spindle speeds; new bed and carriage ways; a totally enclosed quick-change gear-box, with finger-tip dial operation; and automatic lubrication.

Other machines in the line to

be displayed will include the 16-by 54-inch selective-head lathe with direct-reading diameter and direct-reading length attachments, and a new "pancake" flange motor drive; the 18-by 54-inch selective-head manufacturing lathe with cost-cutting attachments for small-lot production and quick change-over to single piece or other repetitive work; and the 20-by 72-inch selective-head oil country lathe which is provided with an 8 9/16-inch hole through the spindle and 21-inch, four-jaw independent chucks on each end of the spindle.

**New 16- by 54-inch Selective-head Engine Lathe to be Exhibited by Lodge & Shipley Co**





**Fig. 1. (Left) Ex-Cell-O Completely Automatic Two-station Tool Grinder**

**Fig. 2. (Right) Form Grinder for Grinding Irregular Forms to Close Tolerances on Small Round Parts**



## ***Ex-Cell-O Production Grinders and Precision Boring Machines***

**Booth 518**

The Ex-Cell-O Corporation, Detroit 6, Mich., will show several new special-purpose grinding and boring machines which have been added to the line of production equipment made by this concern. One of these machines is a Style 35A precision thread grinder. Its operation is completely automatic, the work speed is infinitely variable, and it can be set up with standard change-gears to grind

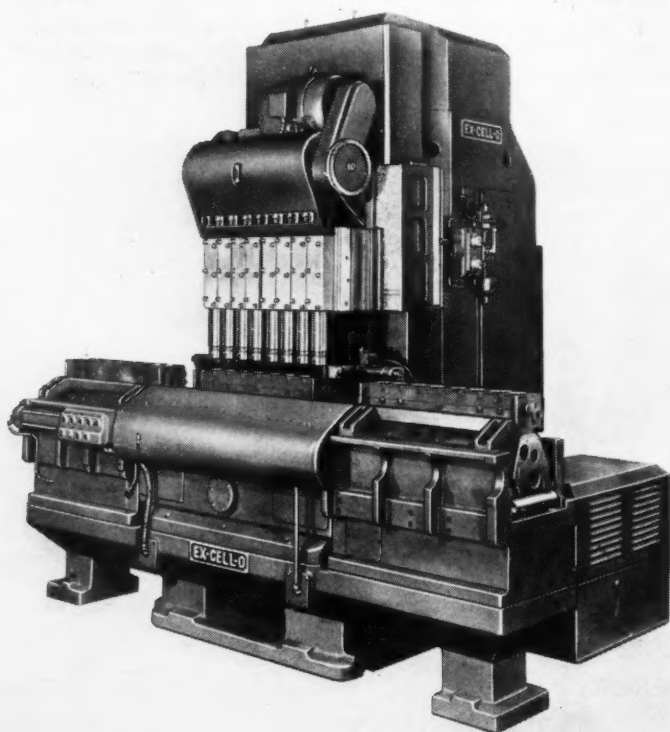
threads with leads from 1 to 128 threads per inch. Although this is essentially a production machine, its adaptability to different types, sizes, and forms of work makes it suited for the tool-room as well.

Another special-purpose machine is the Ex-Cell-O two-station automatic tool grinder (Fig. 1) for grinding the straight faces of solid carbide, carbide-tipped, Stel-

lite, or high-speed steel tools. The precision grinding spindle carries adapters for a 6-inch diamond wheel and a 10-inch silicon-carbide wheel, either of which can be mounted or removed without disturbing the other. After loading and clamping, the automatic cycle takes the tool to the grinding wheel, grinds it for a predetermined length of time, and returns it to the loading position.

A third machine (Fig. 2) is a small form grinder for grinding irregular forms to close tolerances on small round parts. The grinding wheel is shaped by a cam type dresser mounted behind the grinding wheel. The work-drive assembly is supported on a slide that is operated by a hand-lever. When the lever is moved to the right, the work-drive motor starts, an electrically operated coolant valve opens, and the work is fed to the wheel; when the piece is finished, the lever is returned, thus retracting the work, stopping the motor, and closing the coolant valve.

All the remaining machines, including two boring machines and a special automatic for grooving



**Fig. 3. New Vertical Cylinder Boring Machine to be Exhibited at the Show by the Ex-Cell-O Corporation**

**Fig. 4. Ex-Cell-O Automatic for Boring Aluminum-alloy Automotive Pistons**

and chamfering valve stems, are intended primarily for the automotive industry. The Ex-Cell-O Style 66 vertical cylinder boring machine shown in Fig. 3 is especially suitable for automotive engine blocks, but it can be used equally well for boring holes in any part where accuracy of roundness and straightness is required. When the machine is equipped for multiple boring operations, the spindles are driven through a worm and worm-gear.

The spindle slide is hydraulically actuated, and can be controlled either electrically or manually; two adjustable rates of forward feed and a fixed rate of rapid approach and return are available. Fluid pressure for operating the spindle slide is supplied by an independent motor, pump, and sump unit.

The other boring machine (Fig. 4) is a fully automatic unit for boring aluminum-alloy automotive pistons. As each piston is fed to the machine from a chute, the wrist-pin holes are turned into alignment with the boring-bar, after which the piston is carried to the boring position, clamped, rough- and finish-bored, and ejected. There are only three tools in the machine—two rough boring tools and one finishing tool. Bores are easily held within 0.0003 inch for an eight-hour day without tool adjustment, and the production is at the rate of one piston every thirty seconds.

Another Ex-Cell-O exhibit is a machine that cuts two grooves and

chamfers the ends of automotive valve stems at a production rate of 1520 pieces per hour. Six collet chucks are arranged in a continuously rotating table with tool-holders on the under side. The angular valve faces engage locat-

ing seats on the chucks, and as the chucks move away from the front of the machine, the collets clamp the valves, the chucks start to rotate, and the tools engage the work. When the chuck rotation stops, the valves are released.

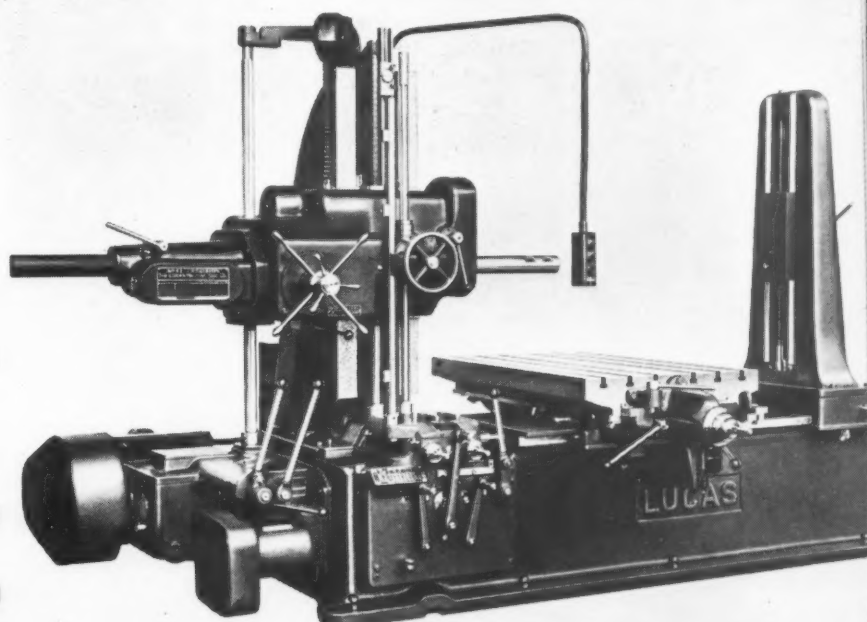
## Lucas Electronic Boring, Milling, and Drilling Machines

### Booth 39

A 4-inch spindle boring, milling, and drilling machine with either complete electronic or electric controls and a four-way bed will be the outstanding exhibit of the Lucas Machine Tool Co., Cleveland, Ohio. Operation of this ma-

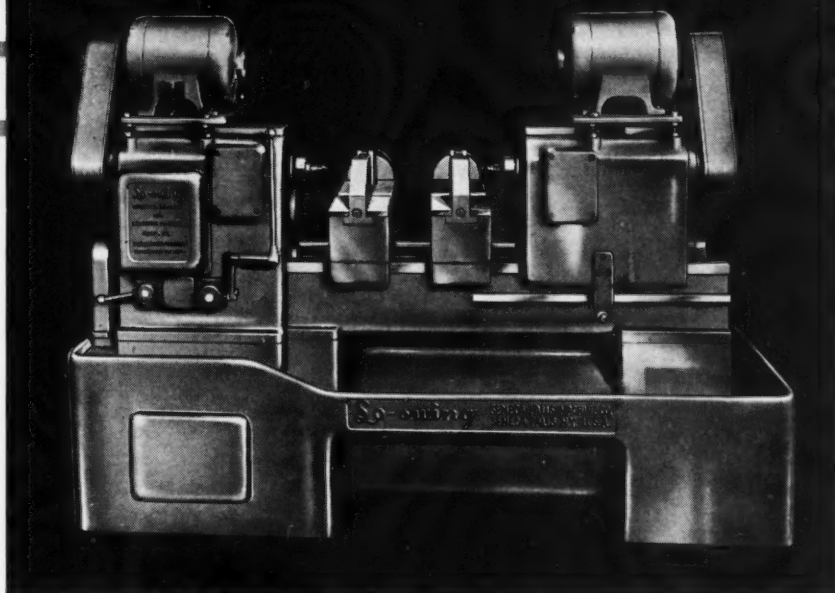
chine—the No. 460 Electronic—can be controlled from the pendant station, including all movements of the head, spindle, table and saddle, after the feeds and speeds have been set manually. The distance between the two outer ways

**Lucas 4-inch Boring, Milling, and Drilling Machine with Completely Automatic Electronic or Electric Control**



is 60 inches. These ways support the saddle and are equipped with hardened steel rollers.

Another machine to be shown—the Model 41 having a 3-inch spindle—has been redesigned to incorporate refinements resulting from wartime experience. High-low speeds to the spindle are featured in this machine, the spindle being driven directly through multiple V-belts on the high-speed range. Electrical pendant control is furnished for starting, stopping, reversing, and jogging.



## Lo-Swing Automatic Lathe and Drilling and Centering Machine

Booth 3

The outstanding feature of the Model AR Lo-Swing automatic lathe (Fig. 1), to be shown by the Seneca Falls Machine Co., Seneca Falls, N. Y., is the instantaneous tool-relief control mechanism, which permits reversing the rotation of the feed mechanism at any time during the machine cycle. This control mechanism reduces tool breakage and "down time." In case of necessity, the operator simply pushes a lever mounted on the carriage, which reverses the rotation of the feed mechanism and thereby returns the carriages and slides to their starting positions without disturbing the timing of the slides or the setting of the tools.

The lathe has all the advantages of a cam-operated machine,

combined with new features which insure ease of change-over, operating control, and flexibility. The spindle mounting and high spindle speeds, together with rigidity, make it possible to take full advantage of the fast cutting speeds permitted with carbide tools.

A simplified change-over mechanism has been incorporated in this machine. All cams can be preset to graduated dials for the desired length of cut. Another feature includes a new type front carriage designed to facilitate loading and unloading. A Model AP lathe, utilizing the same head and tailstock as the Model AR, has a rack-and-pinion carriage feed instead of cams, thus permitting unlimited carriage travel.

The new Model CS Lo-Swing

automatic drilling and centering machine (Fig. 2) replaces the Model CM. The drilling or centering heads have individual motor drive, permitting a wide range of spindle speeds through pick-off gears, which are readily changed. Each centering head is equipped with a feed cam, the rotation of which is controlled from the feed and rapid-traverse mechanism located in the main control centering head. The machine cycle is entirely automatic.

The rapid-traverse control can be preset to graduated dials for the desired timing. Spindle feeds are easily changed through pick-off gears, avoiding the necessity of changing the feed-cams. Both centering heads are automatically lubricated from centralized lubrication pumps, while the coolant pump is driven from the main drive-shaft. Air-operated vises are available. An improved automatic work-driver will also be displayed.

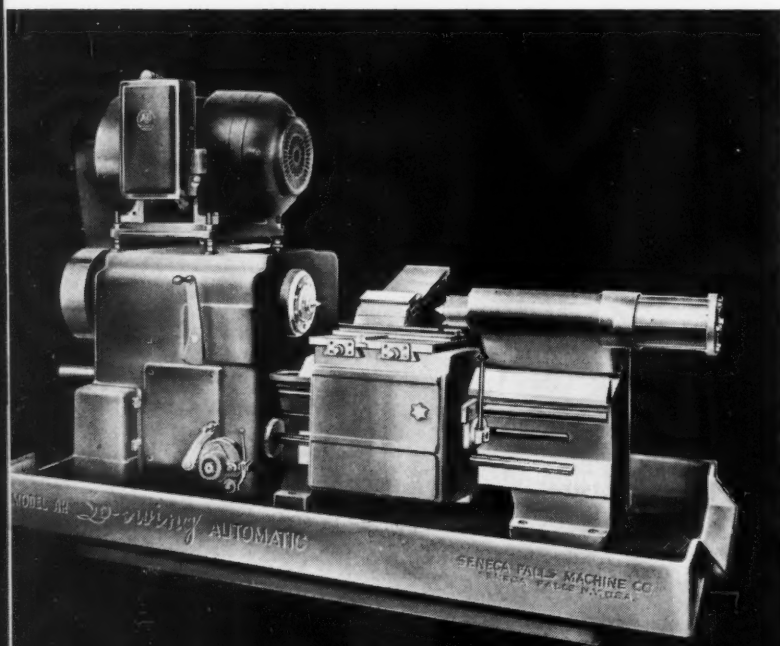


Fig. 1. (Left) Lo-Swing Automatic Lathe with Instantaneous Tool-relief Control Mechanism

Fig. 2. (Above) Automatic Drilling and Centering Machine Made by Seneca Falls Machine Company





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in the Machine Tool Using Industries*



W. H. Casson, Vice-President,  
Manufacturing, Addressograph-  
Multigraph Corp., Cleveland, O.



H. Fletcher Brown, Vice-Presi-  
dent, Production Manufacturing  
Boeing Aircraft Co., Seattle



L. E. Osborne, Vice-President,  
Westinghouse Electric Corpo-  
ration, Pittsburgh, Pa.



Frank L. Magee, Vice-President,  
Aluminum Company of America,  
Pittsburgh, Pa.



Fred E. Harrell, Manufacturing  
Vice-President, Reliance Electric  
& Engineering Co., Cleveland, O.



C. H. Kimmel, Manager, Camshaft  
and Crankshaft Divisions, Ohio  
Crankshaft Co., Cleveland, Ohio



Harry Woodhead, President, Con-  
solidated Vultee Aircraft Corpo-  
ration, San Diego, Calif.



V. W. Fries, Vice-President in  
Charge of Production, White  
Motor Co., Cleveland, Ohio

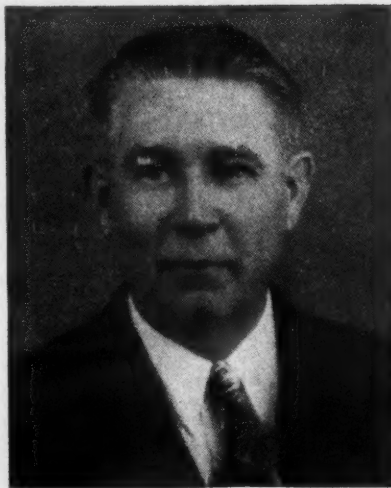


V. P. Rumely, Vice-President,  
Manufacturing Division of  
Crane Co., Chicago, Ill.

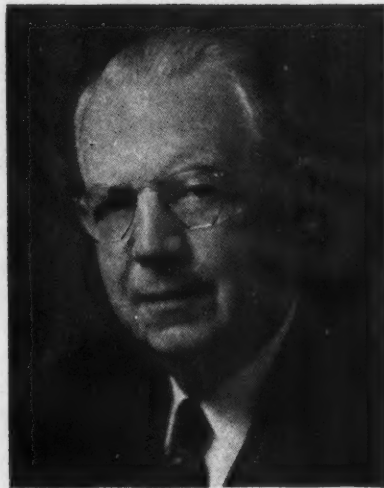
*Men Responsible for Results  
in the Machine Tool Using Industries*



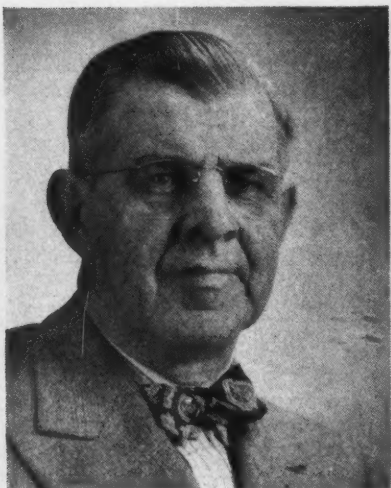
David Cameron, Works Manager,  
Wright Aeronautical Corporation,  
Wood-Ridge, N. J.



A. Gelpke, Vice-President in  
Charge of Production, Auto-  
car Co., Ardmore, Pa.



F. J. Riley, Factory Manager,  
Machinery Division, The Liquid  
Carbonic Corp., Chicago, Ill.



L. C. Miller, General Manager,  
Rouge Plant, Ford Motor Co.,  
Dearborn, Mich.



O. W. Franke, General Works Man-  
ager, Dodge Bros. Div., Chrysler  
Corporation, Detroit, Mich.



Chas. F. Slick, Assistant Works  
Manager, Fairchild Aircraft Div.,  
Hagerstown, Md.



Warren H. Farr, Vice-President  
in Charge of Manufacturing,  
The Budd Co., Philadelphia, Pa.



W. H. Bagley, Master Mechanic,  
Bohn Aluminum & Brass Corpo-  
ration, Detroit, Mich.

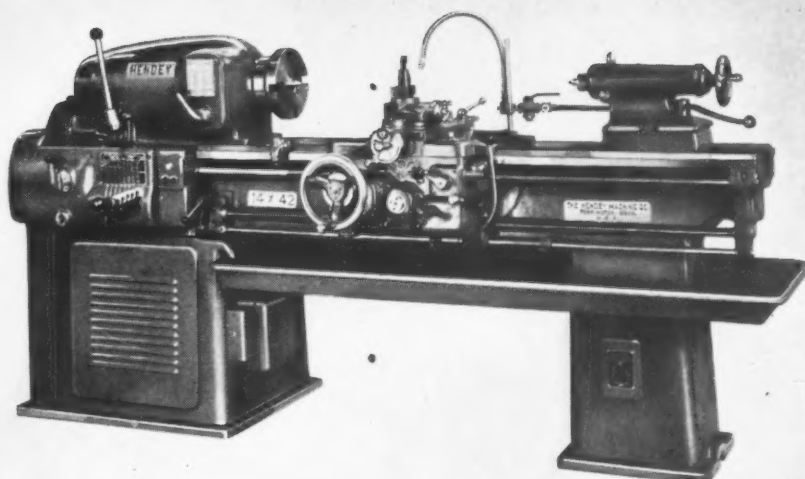


J. V. Carlson, General Factory  
Superintendent, Union Special  
Machine Co., Chicago, Ill.





**Fig. 1. Hendey Light-duty Lathe with Wide Range of Speeds and Feeds and a Remote-control Belt-shifting Arrangement**



## **Hendey Light-Duty and Toolmaker's Lathes**

**Booth 105**

A 14-inch belt-driven lathe with a remote-control belt-shifting arrangement, designed by the Hendey Machine Co., Torrington, Conn., for general purpose, light-duty work will be on exhibit. This No. 2 lathe, shown in Fig. 1, is driven by a 5-H.P. 1800-R.P.M. motor through a four-step cone pulley countershaft and V-belts. Eight speed changes ranging from 30 to 1142 R.P.M. can be obtained by lever control.

Enclosed in a separate housing that is attached to the headstock are the feed-gears and high-speed reverse gears. These give forty-eight thread and feed changes ranging from 1 1/2 to 92 threads per inch and from 0.0027 inch to 0.1663 inch feed per revolution of the spindle; the high-speed reverse automatically returns the

carriage to the same starting position.

Controls on the apron include a start-stop lever, a high-speed reverse rod, a thread-chasing dial, a split-nut cam lever for screw cutting, longitudinal and cross power-feed controls, and a longitudinal hand-feed wheel.

Besides this general-purpose machine, the Hendey exhibit will include the 9- by 24-inch toolmaker's and gagemaker's lathe illustrated in Fig. 2. This is equipped with a variable-speed power unit consisting of an alternating-direct-current motor-generator set that gives stepless spindle speeds from 40 to 2000 R.P.M., both forward and reverse. The quick-change gear-box gives sixty-six feeds and sixty-six threads for either belt or gear drive without

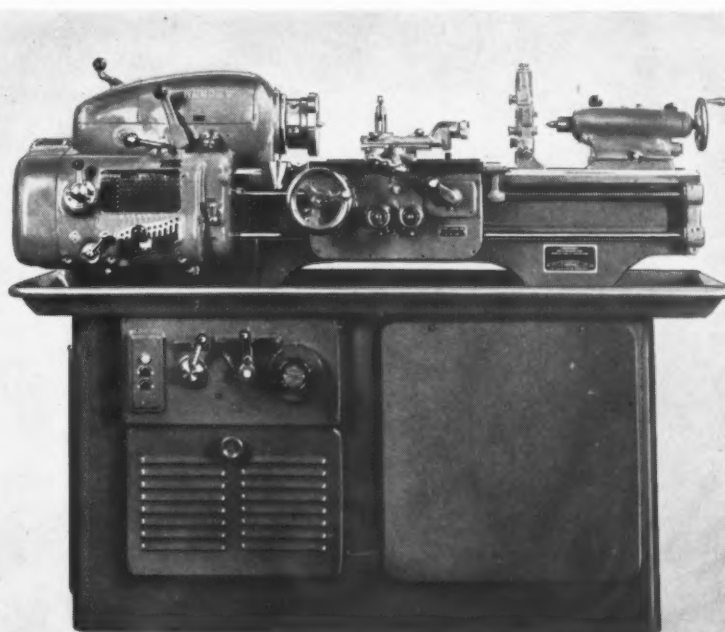
changing gears. An interlocking safety feature prevents simultaneous engagement of feeds.

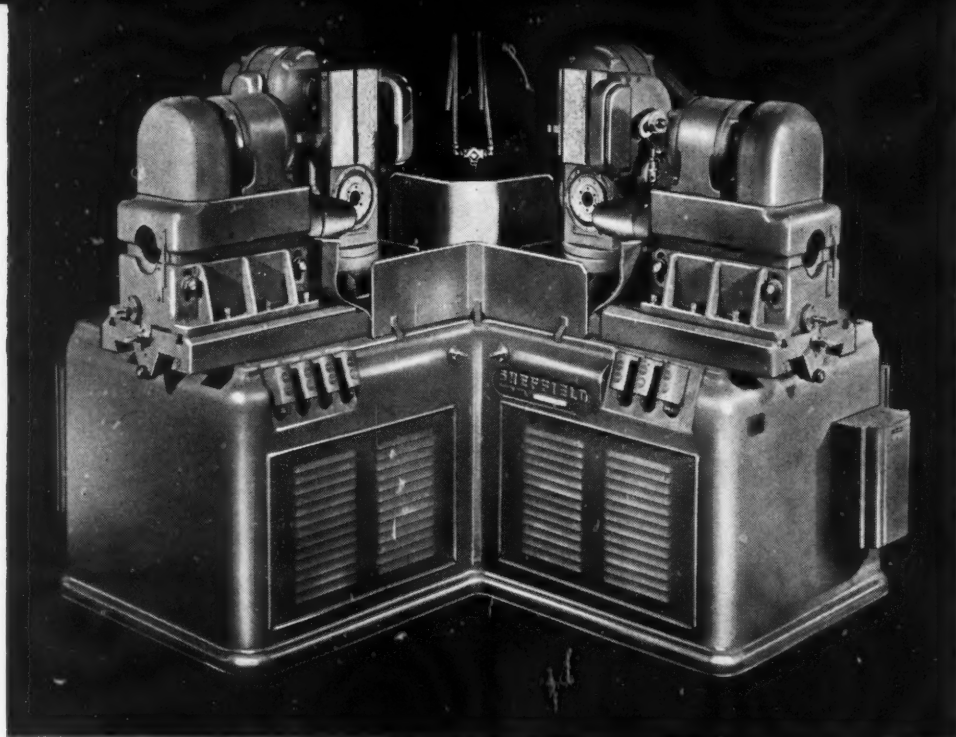
## **Dayton V-Belts Made with Rayon Cord**

**Booth 328-G**

Rayon cord is being used by the Dayton Rubber Mfg. Co., Dayton 1, Ohio, to minimize the stretch, increase the flexure strength, and lengthen the life of "Thorobred" V-belts, to be displayed at the Show. The rayon, which is of the continuous-filament, high-tenacity type, is woven into strands and embedded in the neutral or strength section of the belts. Because rayon has great strength in small diameters, the belts can be made more compact without affecting their transmission capacity, and bending stresses are minimized.

**Fig. 2. Tool- and Gage-maker's Lathe with Stepless Spindle Speeds Ranging from 40 to 2000 R.P.M.**





## LATEST PRODUCTION

*Fig. 1. New Sheffield Chamfering Machine which will Chamfer, Point, or Burr Gear Teeth and Splines*

### *New Equipment Developed by Sheffield*

**Booth 202**

The Sheffield Corporation, Dayton 1, Ohio, is offering a new line of completely redesigned machines for chamfering, pointing, or burring gear teeth and splines. Eight different models are available, one of which is shown in Fig. 1; six are built to use standard high-speed steel cutters, and two models use carbide cutters. All of these machines are available in either single-head or twin-head styles.

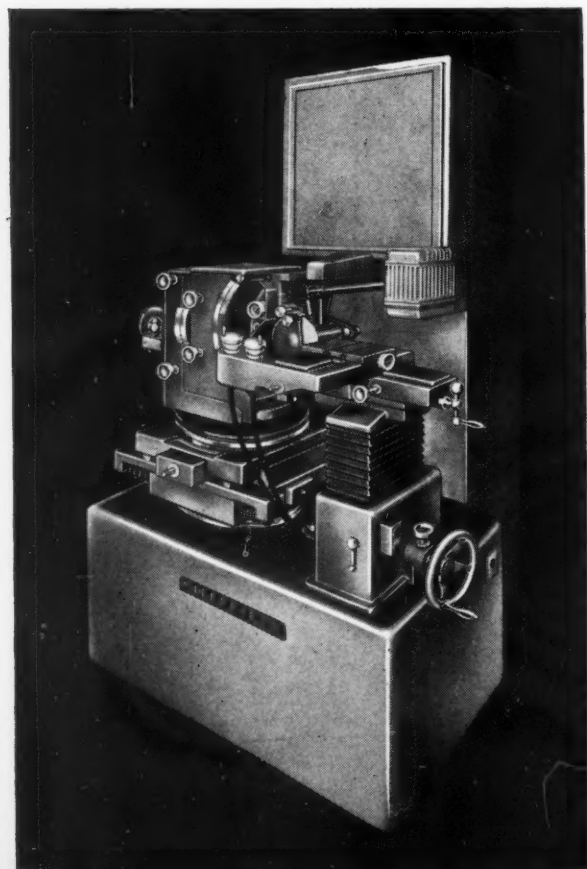
Two models are of the quick-change type for short runs, but they can also be used for production; the other six models are strictly production machines. Chamfering time has been reduced as much as 40 to 50 per cent, and cutter life increased threefold with an improved finish on the work.

The new Micro-Form grinder, Fig. 2, is a precision machine de-

signed to accurately finish-grind any desired profile within its range directly from the drawing. It is especially suited for grinding both circular and flat form tools, templates, profile gages, cams, dies, etc., from hardened materials, including tungsten carbide. The machine can be used reversely for making 50 to 1 lay-out drawings from parts with unknown profiles and for checking parts against lay-out drawings.

The optical system of this grinder uses either contour or opaque projection with surface illumination, and 25 to 1 or 50 to 1 magnification. A prism incorporated in the optical system places the image in a natural position relative to the work, so that confusing opposites in movement of work and projection are avoided. Remote movement of the wheel-head is accomplished hydraulically, allowing the operator to sit before the projection screen while operating conveniently placed micrometer wheels. The operator can see the work and wheel in natural colors amplified on the screen.

The burnishing machine seen in Fig. 3 is designed to iron out irregularities in the tooth profile and to compress the surface metal,



*Fig. 2. Micro-Form Grinder Made by the Sheffield Corporation for the Accurate Grinding of Profiles directly from a Drawing*

**Fig. 3. Sheffield Gear-tooth Burnishing Machine for Correcting Any Distortion of Tooth Spacing after Hardening**



forming a denser and tougher structure of gear teeth. Gears are burnished after heat-treating to correct any distortion of tooth spacing occurring during the

hardening process. Burnishing also rolls down burrs caused by rough handling. The machine is hydraulically driven and relatively easy to operate.

carbide milling on cast iron, steel forging billets, and on steel die-blocks. This machine has all the rigidity, power, and spindle speeds required for this type of work.

## ***Ingersoll Vertical-Spindle Milling Machine***

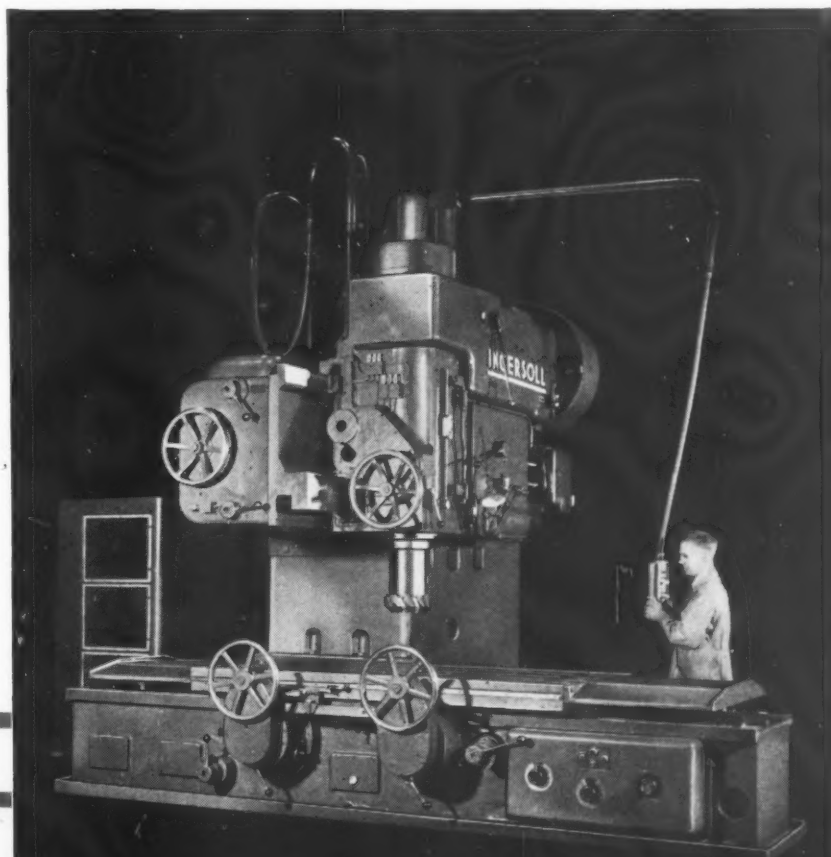
**Booth 58**

A vertical-spindle milling machine with variable-voltage drive for spindle speed, feed, and rapid traverse, and with an all-electric transmission, will be exhibited by

the Ingersoll Milling Machine Co., Rockford, Ill. This machine, which is a typical example of the specialized machinery developed by the company, was designed for

In order to simplify the transmission of the large amount of power at the speeds at which the machine operates, an electrical transmission is utilized. This transmission eliminates considerable weight and bulk that otherwise would be necessary were a mechanical transmission employed. Another feature are the controls, which have been simplified and concentrated in a pendant station.

***A New Vertical-spindle Milling Machine will be a Feature of the Ingersoll Exhibit. It is Provided with Variable-voltage Drives and All-electric Transmission***



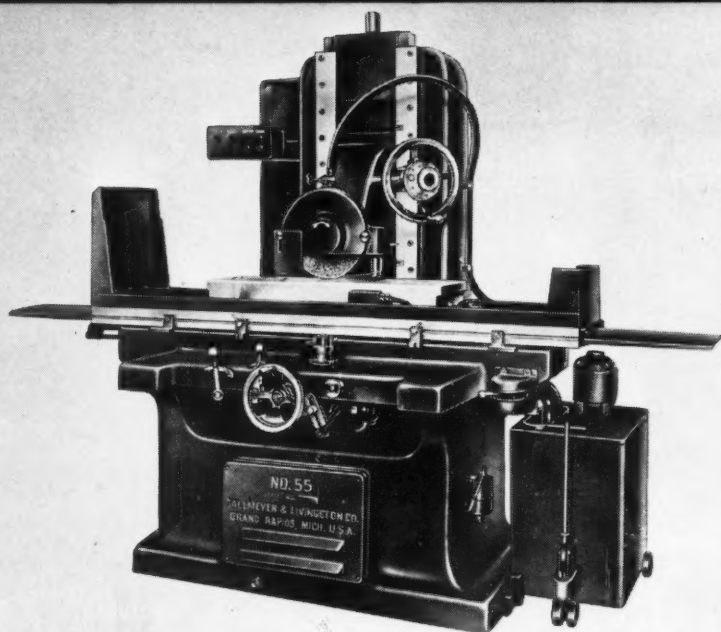


Fig. 1. New Grand Rapids Hydraulic-feed Surface Grinder to be Exhibited by Gallmeyer & Livingston Co.

## Gallmeyer & Livingston Tool and Surface Grinders

Booth 230

Among the new machines to be seen at the Show will be a Grand Rapids hydraulic-feed surface grinder, built around a special high column and equipped with a 20-inch grinding wheel. This machine, developed by the Gallmeyer & Livingston Co., 305 Straight St. S. W., Grand Rapids 4, Mich., makes possible the grinding of dies with guide or leader pins in position.

The working surface of the table is 12 by 36 inches, and the longitudinal and transverse movements are sufficient to enable the operator to clear the entire working surface of the table with the standard wheel. The capacity under the grinding wheel is 17 inches, and the wheel-head has a vertical movement of 18 inches.

A power-driven wheel-head with provisions for rapid travel is standard equipment. Separate motors are furnished for driving the hydraulic mechanism and the grinding-wheel spindle, thus making it possible to eliminate the use of the idler jack in conjunction with the spindle drive and to provide for two usable spindle speeds.

In addition, a No. 80 hydraulic-feed universal and tool grinder will be on display. The hydraulic drive in this machine provides for an unlimited number of longitudinal table speeds, ranging from 6 inches to 50 feet per minute. Work speeds of 80, 160, 260, and 525 R.P.M. can be obtained. Automatic lubrication is provided, and prelubricated sealed ball bearings support the spindle.

## Sapphire Burnish-Sizing Tool

Booth 35-E

A sapphire burnish-sizing tool, designed to bring powdered metal and other soft bearings back to shape and size after staking operations, will be shown by the Sapphire Products Division, Elgin National Watch Co., Aurora, Ill. The new sapphire tool imparts a burnished surface to the bore of the bearing without interfering with self-oiling properties. This tool is available in sizes from 0.125 to 0.700 inch in diameter. The dense crystalline sapphire tool does not tear or seize the bearing surfaces.

Among the other products to be exhibited by this company will be cutting and boring tools for plastics and soft metals, sapphire ball bearings, gages, wear strips, and diamond charged saws.



Fig. 2. Gallmeyer & Livingston Hydraulic-feed Universal and Tool Grinder with Infinitely Variable Table Speeds

**"Rapiduction" Automatic-cycle Lathe to be Exhibited at the Machine Tool Show by the Oster Mfg. Co.**



## **Oster Lathes and Threading Machines**

**Booth 634**

A new "Rapiduction" automatic-cycle lathe for forming, facing, and other cross-feed operations will be seen at the exhibit of the Oster Mfg. Co., 2073 E. 61st St., Cleveland 3, Ohio. This machine has a swing over the cross-slide of 8 inches and a chucking capacity of 1 1/2 inches.

Hydraulically operated cross-slide, solenoid-controlled valves and other control features provide an automatic cycle of fast approach, feed, dwell, fast retraction, and stop. The automatic cycle of cross-slide operations can be arranged for feed in one direction only or in two directions, as required. For set-up purposes, manual control is provided.

Regular equipment includes a hydraulically operated, draw-back collet chuck with master collet,

hydraulically operated cross-slide with one or two directional cycle; motor-driven hydraulic pump and controls; a four-speed motor of the constant-torque type; semi-magnetic speed control; and a coolant pump with individual motor drive.

Other Oster machines, including the No. 601 "Rapiduction" turret lathe and six types of pipe and bolt threading machines, will be exhibited.

## **Smith & Mills Shapers**

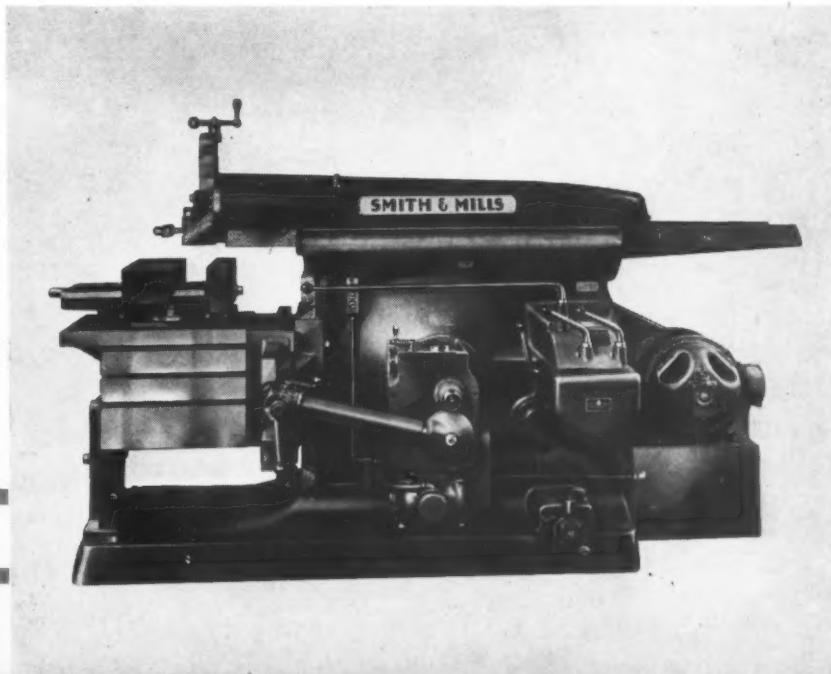
**Booth 665**

The Smith & Mills Co., 2889 Spring Grove Ave., Cincinnati 25, Ohio, has recently developed an improved ram for its line of 12-,

16-, 20-, 25-, 28-, and 32-inch crank shapers. The new ram eliminates the driving slot arrangement formerly necessary for the ram-position locking stud. Elimination of the slot adds to the strength of the ram without increasing its weight. The improved ram also incorporates a self-locking ram-position feature.

The thrust of the cut is taken on a large-diameter ram adjusting screw, mounted in anti-friction thrust bearings. An automatic compensating double nut is used to prevent backlash between the screw and the ram-carrier. This nut furnishes sufficient friction to prevent the adjustment from changing under the heaviest cuts. To position the ram, it is only necessary to rotate a conveniently located shaft. Adjustment can be made either while the machine is in operation or at rest. It is not necessary to hand-lock the ram-carrier after adjustment.

**Smith & Mills Crank Shaper with an Improved Ram that Eliminates the Driving Slot Arrangement**



## National Acme Exhibits New Bar Automatics and Other Tools

Booth 628

The new bar automatics to be shown by the National Acme Co., 170 E. 131st St., Cleveland 8, Ohio, have been designed to achieve higher output, greater precision, and improved operating convenience. Among the features of the 1 1/4-inch model RB Acme-Gridley six-spindle bar automatic (Fig. 1) are the following:

The box type rigid frame and heavier machine construction resists the vibration imposed by stronger tools operating at faster feeds and speeds. Broader use of attachments has made possible the performance of operations previously done on secondary equipment. Operating conveniences, such as increased area of the tooling zone, reduction in machine set-up and change-over time, interchangeable feed and speed gears, automatic chip conveyor disposal, and automatic devices for visual control are included.

The lower forming side slides are operated directly by drums and cams through rolls. These slides can be adjusted by one gib, and can be made of any width required to accommodate tools. The space between the headstock and gear-box has been lengthened to



Fig. 2. Improved Chronolog Made by National Acme Co.

accommodate longer work, permit easier set-up, and allow more chip space and additional tools and attachments. In the top section and intermediate slides, control drums and cams are located directly behind the slides. Each slide is independently cammed for faster production and longer tool life.

A new type threading attachment employs an adjustable lever for independent control of movement of the die slide, and is equipped with a follow-up cam for

different thread pitches. The drive mechanism has been made universal, so that practically any attachment can be applied to the machine. A cam dial indicator enables the operator to tell the exact location of the cams operating the tool-slides, the position of the stop-stock mechanism, and the lock-bolt and index arm movements for the spindle carrier. A power wattmeter registers the horsepower consumption for different set-ups.

The improved type Chronolog (Fig. 2) provides a simple accurate method of recording the number of pieces produced and the dura-

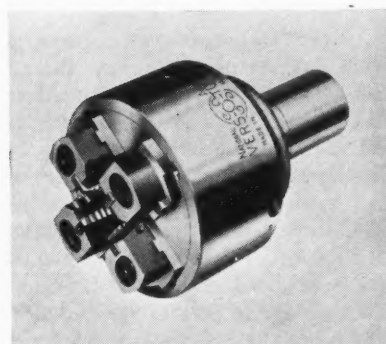
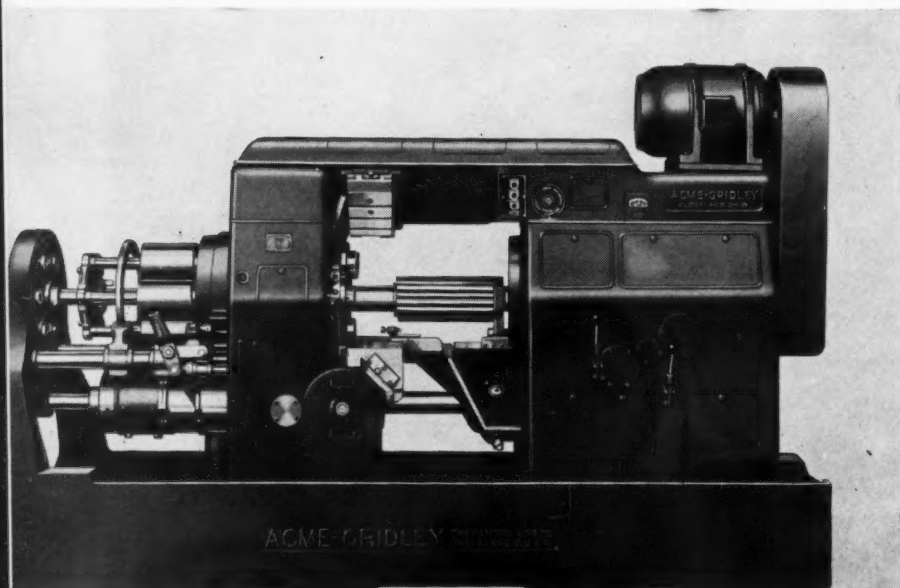


Fig. 3. Circular "Vers-O-Tool" with Adjustable-blade Chasers

tion of machine "down time." With this system of control, the number of non-productive employees can be reduced and information can be obtained for establishing production standards, arriving at accurate costs, and controlling scheduling.

Adjustable-blade chasers can now be used in standard "Vers-O-Tool" heads, such as the one shown in Fig. 3. The chasers are moved ahead after each grind, so that the cutting edges are always in their proper cutting position. This provides chaser adjustment to suit various materials by changing the grind and setting only. Two sizes of blade holders and seventeen sizes of blocks cover the complete range of standard "Vers-O-Tool" heads from 3/8 inch to 1 5/8 inches.

Fig. 1. Acme-Gridley Six-spindle Automatic Having a 1 1/4-inch Bar Capacity







*Men Responsible for Results  
in the Machine Tool Using Industries*



Roy L. Congdon, Superintendent,  
Machinery, Craig Shipbuilding  
Co., Long Beach, Calif.



C. A. Sharpe, Vice-President,  
Manufacturing, Gar Wood In-  
dustries, Inc., Wayne, Mich.



M. J. Lesko, Plant Manager, Re-  
public Aircraft Products Division,  
Avco Mfg. Corp., Detroit, Mich.



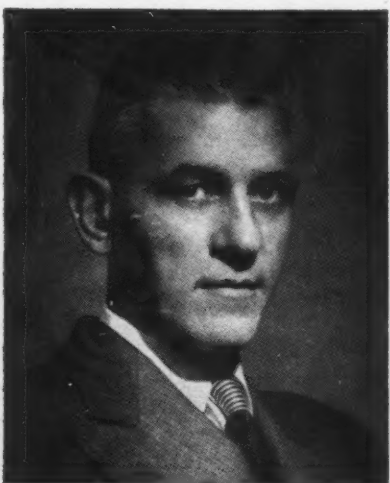
J. E. Faust, Master Mechanic,  
Hercules Motors Corporation,  
Canton, Ohio



Lyle P. Ellis, General Superin-  
tendent, Manning, Maxwell &  
Moore, Inc., Bridgeport, Conn.



Rear Admiral T. D. Ruddock, U. S.  
Navy, Superintendent, U. S. Naval  
Gun Factory, Washington, D. C.



Leland A. Brown, Vice-President,  
Manufacturing, Landers, Frary &  
Clark, New Britain, Conn.



Louis H. Young, Vice-President,  
Manufacturing, Gillette Safety  
Razor Co., Boston, Mass.



O. V. Badgley, Vice-Pres., General  
Motors Corp. and Gen. Manager,  
Delco-Remy Div., Anderson, Ind.

*Men Responsible for Results  
in the Machine Tool Using Industries*



R. M. Fullerton, Mgr. of Mfg.,  
Sturtevant Div., Westinghouse  
Electric Corp., Hyde Park, Mass.



G. M. Salzman, Executive Vice-  
Pres. and Factory Manager, Mon-  
mouth Products Co., Cleveland



Harold Jeter, Manufacturing Man-  
ager, Peoria Division of R. G.  
LeTourneau, Inc., Peoria, Ill.



E. P. Stein, Factory Super-  
intendent, Bastian Blessing  
Co., Chicago, Ill.



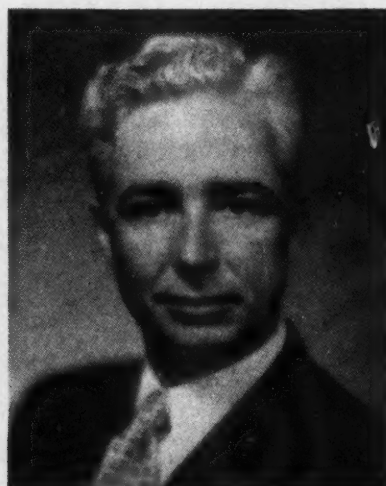
Corwin Lamoreaux, Master Me-  
chanic, Richards-Wilcox Manu-  
facturing Co., Aurora, Ill.



August Trauth, General Superin-  
tendent, S & S Corrugated Paper  
Machinery Co., Brooklyn, N. Y.



Joseph O. Bluhm, Chief, Instrument  
Division, Frankford Arsenal, Phila-  
delphia, Pa.



Erle Martin, General Manager,  
Hamilton Standard Propellers,  
East Hartford, Conn.

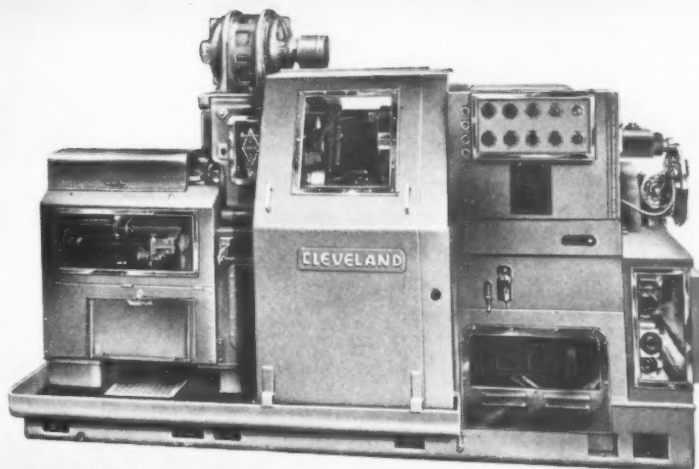


Hugo A. Weissbrodt, Works Man-  
ager, Fort Wayne Works, Inter-  
national Harvester Co.





**Fig. 1. Cleveland "Dialmatic" 2 1/2-inch Single-spindle Automatic Turret Machine with Electric Tool Feed Drive**



## Cleveland Automatic Turret Machine and Die-Casting Machine

Booth 510

A new Cleveland 2 1/2-inch single-spindle automatic turret machine (Fig. 1), known as the "Dialmatic" Model AB, will be exhibited by the Cleveland Automatic Machine Co., 4936 Beech St., Cincinnati 12, Ohio. The "Dialmatic" feature is an electric tool feed drive which makes independent, infinitely variable forward and return tool feeds possible, without cam changes, for each of the five tool positions in the turret-head.

When spindle speeds have been set, and the desired rate of feed determined, the operator simply refers to a conveniently located feed chart to determine the correct dial setting for the control panel. The rotary selector switch automatically cuts in the proper rheostat for each tool position, and the speed of the direct-current motor is automatically changed to

provide the pre-selected feed. The feed rate can be changed for any tool while it is cutting.

It is possible to quickly remove the feed-tube member from the spindle and substitute a chuck and air cylinder with pull-rod. On the spindle nose, provision has been made for removing the collet and substituting a three-jaw chuck. A hopper type magazine can be furnished for automatic loading.

An independent overhead slide is furnished for cutting-off operations, allowing the front and rear cross-slides to be used for rough- and finish-forming. Four automatic spindle speeds (forward and reverse) are available, with a total of 112 spindle speed selections ranging from 24 to 1820 R.P.M. Indexing of the turret is accomplished by the use of a four-slot Geneva indexing mechanism.

The second new Cleveland ma-

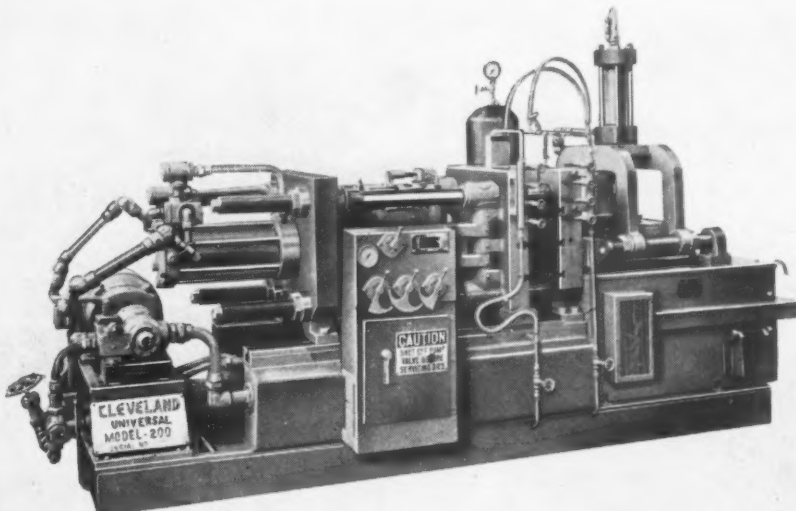
chine to be exhibited is the Model 200 high-pressure hydraulic die-casting machine (Fig. 2). This machine is capable of locking dies with high pressure to produce castings with a minimum of flash. Among the features of this machine are automatic timing, combined with selective manual controls; a large die area and plates; wide spacing between tie-bar centers; and hydraulic controls for ejection and core pulling.

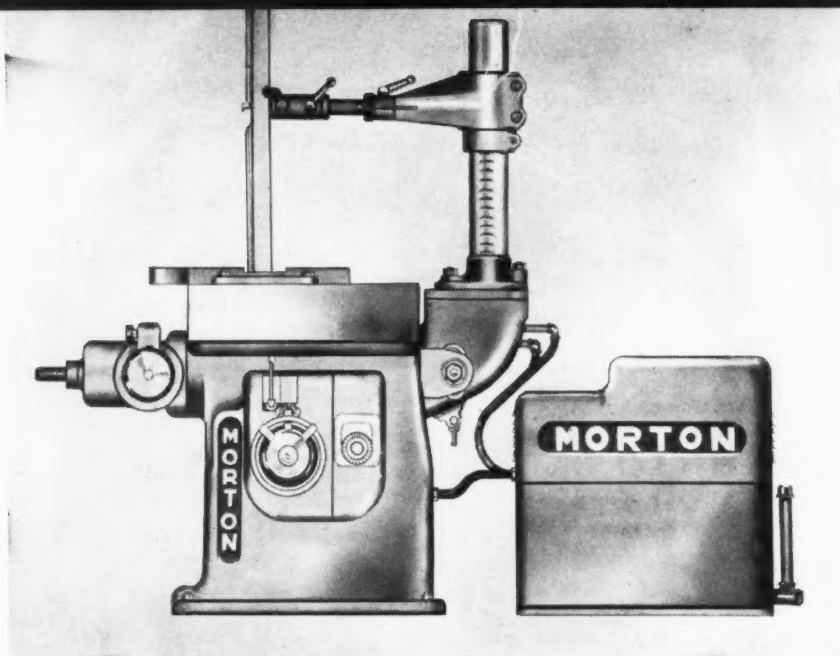
## Stuart Centerlube

Booth 317-L

A feature of the exhibit of the D. A. Stuart Oil Co., Ltd., 2739 S. Troy St., Chicago 23, Ill., will be its center-point lubricant for use on lathes, milling machines, grinding machines, steadyrests, and other machine tools that carry a heavy load on a small area. This lubricant, known as "Centerlube," possesses an unusually high load-carrying capacity, and prevents galling or burning of centers.

**Fig. 2. High-pressure Hydraulic Die-casting Machine to be Shown by the Cleveland Automatic Machine Co.**





## LATEST PRODUCTION

*Hydraulic Keyway Cutter and Slotting Machine to be Exhibited by the Morton Mfg. Co.*

### *Morton Keyway Cutter and Slotter*

**Booth 120**

A hydraulically driven keyway cutter and slotting machine that is capable of cutting tapers up to 1/2 inch per foot forward and 1 inch per foot backward will be demonstrated by the Morton Mfg. Co., Muskegon Heights, Mich.

One of the chief advantages of this machine is that the work remains stationary at all times. Taper keyways in straight bores or straight keyways in taper bores are obtained without any special provision for tilting the

work. The depth of cut of the keyway can be quickly set or can be varied during the operation without releasing the work.

Automatic feeds ranging from 0.001 to 0.020 inch per stroke are available. The cutting speed range is 10 to 25 feet per minute, and the quick return speed 75 feet per minute. Automatic relief of the cutter bar on its return stroke is provided. The floor space required is about 3 feet wide by 8 feet long.

its own pump, motor, and oil reservoir built into the housing of the wheel-slide.

Besides handling ordinary flat work, this machine can be used for finishing large castings weighing up to 5 tons; or it can be adapted for shoulder and edge work and for V-type and flat ways or contours. Owing to the rigidity of the spindle mounting, it is said that interrupted surfaces are held to closer limits of accuracy than usually can be obtained.

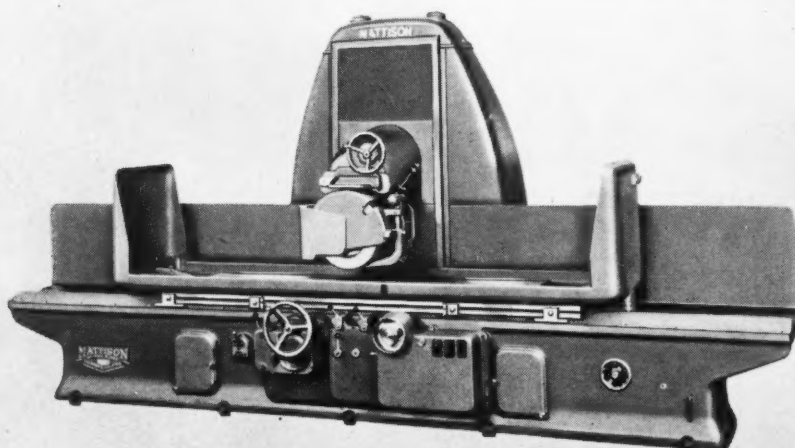
A wide range of sizes is offered, tables being available from 12 to 36 inches wide and from 36 to 192 inches long. The wheel-head can be adjusted vertically to allow from 16 to 24 inches (depending on the machine size) between the wheel and the table. Larger table sizes and additional wheel-head capacity can be provided if desired. All motors are totally enclosed and protected against oil, water, and metal dust. A Mattison wide-belt sheet grinding and polishing machine will also be seen in operation.

### *Mattison Surface Grinders and Sheet Grinding Machines*

**Booth 46**

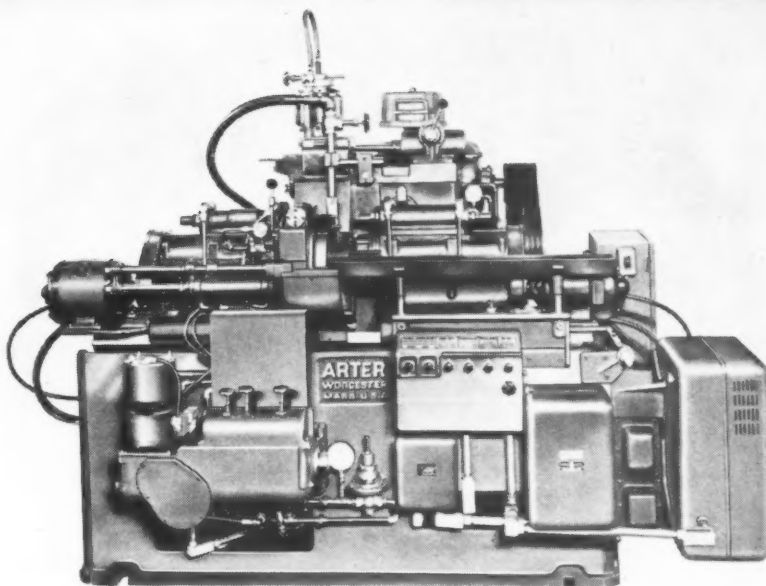
An improved surface grinder for heavy-duty, high-precision work, built by the Mattison Machine Works, Rockford, Ill., will be seen in operation at the Show. Hydraulic drives are applied to

both the table and the traverse feed of the grinding wheel, and all controls are centrally located. The grinding spindle lubricating system is entirely independent of the rest of the machine, having



*Improved Precision Surface Grinder with Hydraulic Feed Built by Mattison Machine Works*

**Fig. 1. Arter Automatic Cylindrical Grinder for Finishing Cylindrical or Tapered Surfaces**



## *Arter Cylindrical and Rotary Surface Grinders*

### **Booth 31**

The automatic cylindrical grinder shown in Fig. 1 was developed by the Arter Grinding Machine Co., Worcester 5, Mass., for grinding cylindrical or tapered surfaces on work that can be held on centers. Either straight-in or plunge-cut feed methods can be used. The work is loaded into a turret having a number of holes. As the turret indexes to the grinding position, the two live centers, or collets, automatically pick up and drive the work. A section of the turret is cut away so that the wheel, which moves automatically, can contact the work and grind it to size. Successive indexing movements bring the work to a chute, onto which it is automatically discharged. The turret is indexed by a hydraulic gear motor, and has independent manual control.

The wheel-spindle is eccentrically mounted in a quill, the grinding movement being obtained by

rocking the quill. The wheel-head can be swung slightly for grinding tapered surfaces. Two large dials indicate movements representing 0.0001 and 0.001 inch of diametral reduction of the work. The wheel-spindle can be oscillated slightly within its bearings, the rear bearing housing moving with the spindle. The head and tailstock are driven by a pair of direct-current motors, permitting the selection of exactly the right speed for the diameter of work being ground. The work is revolved by frictional force, created by end pressure of the centers on the work.

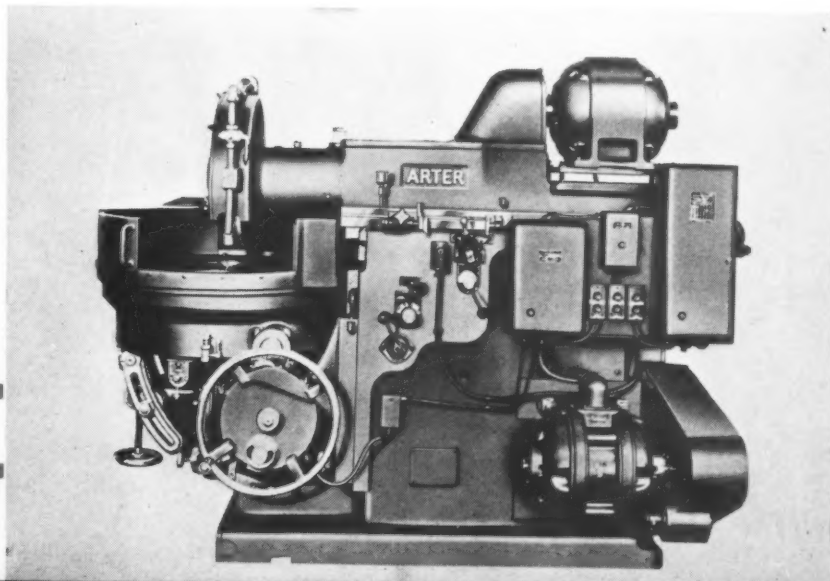
Hydraulic movements are synchronized and controlled from a valve-operated camshaft. Knobs are provided to permit independent operation of each valve in setting up a job. The grinding cycle is determined by the particular pick-off gears used. This cycle, in

terms of productive rates, ranges from 240 to 840 per hour.

The Model B rotary surface grinder, which is built in 20-, 24-, 30-, and 40-inch sizes, is shown in Fig. 2. The wheel-slide is moved by a piston, the chuck is driven by a hydraulic motor, and hydraulic means are employed for the automatic, power work-table elevating feed. The work-table can be tilted up or down on trunnions when grinding conical surfaces. A handwheel tilts the table and a fine-pitch screw with an indicator disk provides means for quickly determining the flat or tilted position of the chuck. Power feed of the handwheel can be made in increments of 0.0001 inch.

Control of wheel-slide traverse is in a combination starting, stopping, and reversing valve of the balanced piston type. The standard work-table has a built-in magnetic chuck. Work 8 inches thick can be ground on the 20-, 24-, and 30-inch machines; and work 6 inches thick can be handled on the 40-inch machine.

**Fig. 2. Hydraulic Rotary Surface Grinder to be Exhibited at the Show by the Arter Grinding Machine Co.**



*Potter & Johnston Model 3U Speed-Flex Automatic Turret Lathe for Machining Castings and Forgings up to 6 Inches in Diameter*

## *Potter & Johnston Turret Lathes*

### **Booth 43**

Standard and high-speed 3U Speed-Flex automatic turret lathes built by the Potter & Johnston Machine Co., Pawtucket, R. I., will be seen in operation at the Show. The machine illustrated has been developed for machining castings and forgings up to 6 inches in diameter. It is regularly furnished with spindle speeds ranging from 73 to 1445 R.P.M., but dual speed ranges of 36 to 711 R.P.M. and 73 to 1445 R.P.M. can be provided. Turret-slide and cross-slide feeds range from 0.0023 to 0.0684 inch, or from 0.0042 to 0.125 inch per spindle revolution.

Adjustment of the spindle in the headstock provides for varying the minimum distance between the spindle nose and the various turret faces. Four automatic changes of spindle speed are obtainable for each set of hand

pick-off gears, and three automatic changes of feed can be similarly secured. Multiple-disk clutches for speed and feed changes are engaged and disengaged by a dog on the control drum and electro-pneumatic control.

The cross-slides of the machine act either independently or simultaneously in conjunction with selected turret faces, and can operate with all six turret faces. The turret is automatically clamped in

position after indexing. The turret-slide is actuated by a face cam, and is provided with a cam-actuated plunger for the operation of vertical and horizontal slide tools. Provision has been made for an overhead piloting arrangement, and taper boring attachments, turning attachments, and other tool equipment are available.

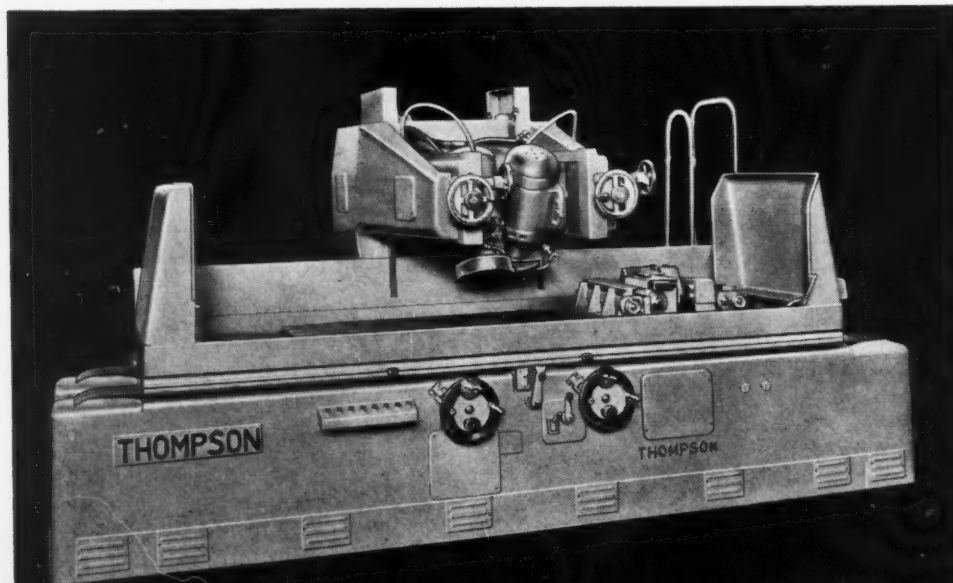
The high-speed model is a duplicate of the small size turret lathe, except that the full speed range is from 104 to 2068 R.P.M., which is obtainable through six sets of pick-off gears and four automatic speed changes.

## *New Grinding Machines Added to Line of Thompson Grinder Co.*

### **Booth 114**

A new machine made by the Thompson Grinder Co., Springfield, Ohio, to eliminate the tedious and expensive job of hand-scrap-

ing machine tool dovetail way bearings is shown in Fig. 1. The machine has a capacity for a 12-by 48-inch dovetail slide. Size is



*Fig. 1. Thompson Dovetail Way Grinding Machine that Eliminates Hand-scraping*

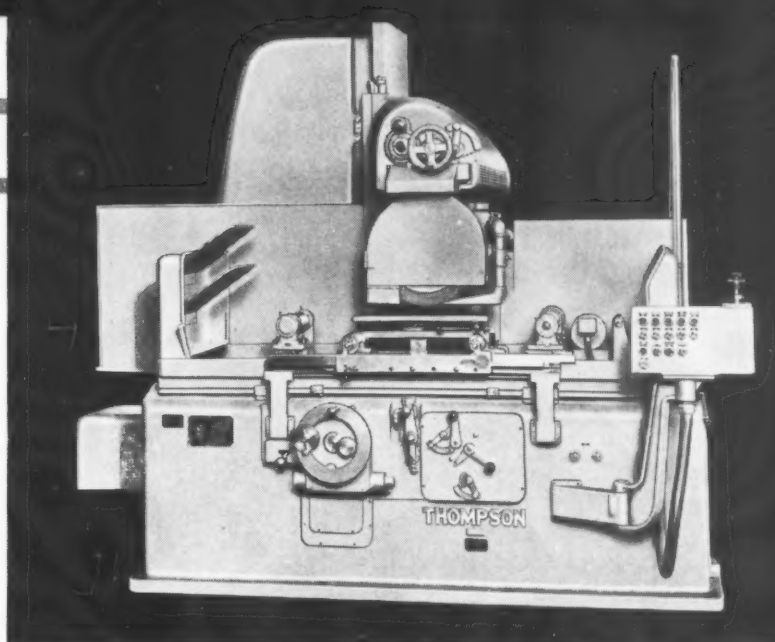
## PRODUCTION EQUIPMENT AT SHOW

controlled by means of electric diamond dressing devices. The machine is so arranged that both sides of the dovetail bearing can be ground simultaneously, to a predetermined dimension.

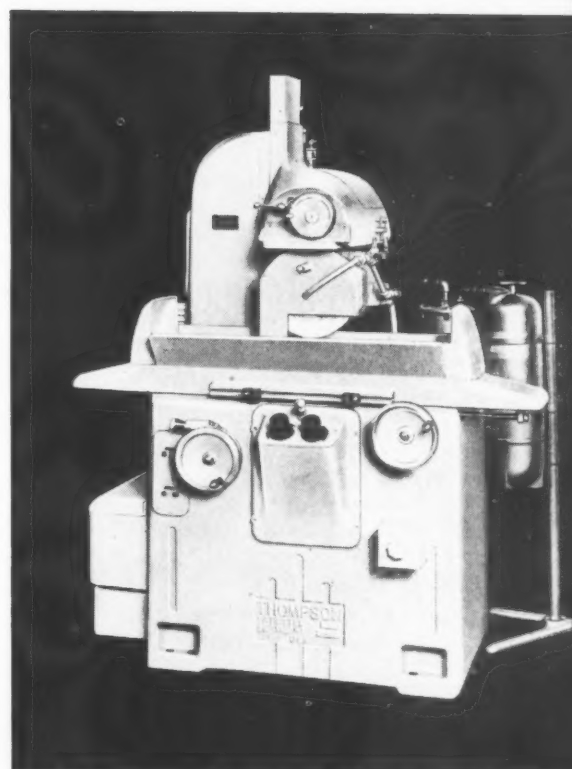
The latest design Truforming (crushed wheel grinding) machine, arranged with thread-roll die-grinding fixture, is shown in Fig. 2. This Type C 16- by 16- by 36-inch grinder is equipped with a 20-inch diameter by 6-inch face wheel, driven by a 30-H.P. motor. When the dies are worn, they can be reground without any other processing. Production grinding of intricate contours, such as flat form tools, serrated milling cutters, tangent type thread chasers, and many other precision forms, can be performed on the Type B 12- by 11- by 36-inch Truforming grinder. Automatic wheel crushing, and the regrinding and reproduction of crushing rolls, as well as automatic size control, are features incorporated in these machines.

Equipped with a precision spindle driven by a 40-H.P. motor, the hydraulic surface grinder seen in Fig. 3 is capable of heavy stock removal on large areas, producing the high degree of finish and accuracy necessary for grinding machine tool bearing surfaces. All the ways of this heavy-duty Type CX 36- by 48- by 120-inch machine are completely covered. Automatic lubrication is provided for all the important bearing surfaces.

The Type F 6- by 10- by 18-inch hydraulic surface grinder (Fig. 4) incorporates a new principle of applying coolant to the grinding wheel. All of the coolant is applied through the grinding wheel, making it possible to grind exceptionally thin sections without burning or warping the work. Very fine finishes are obtained to extremely close dimensions. In grinding blanking dies and other metal cutting or shearing tools, no amorphous metal is present after grinding, thus increasing the life of the tool between grinds.

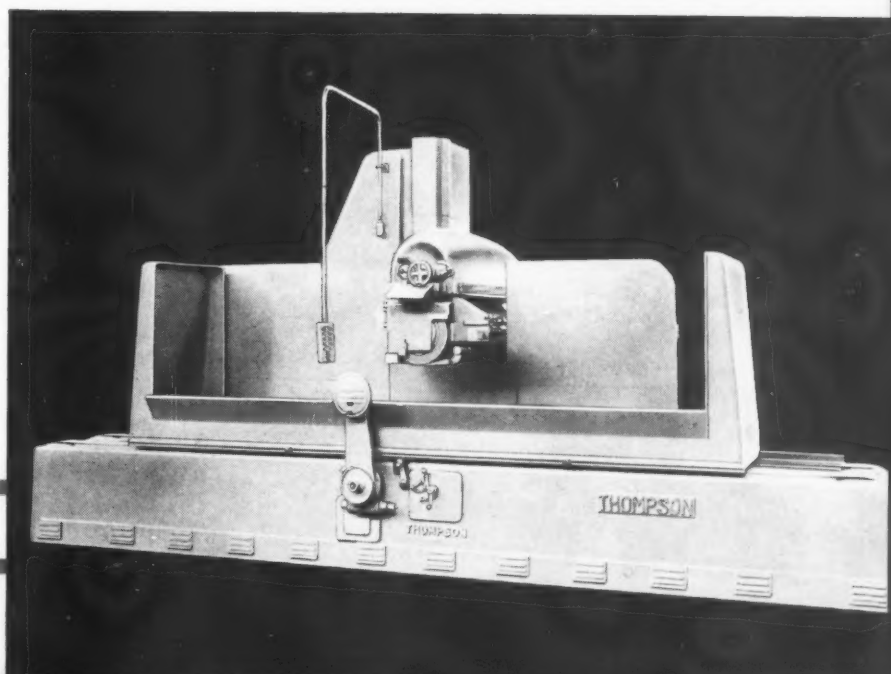


**Fig. 2. (Above) Truforming Grinder with Thread-roll Die-grinding Fixture, Made by Thompson Grinder Co.**



**Fig. 3. (Below) Thompson Heavy-duty Hydraulic Surface Grinder Having a 40-H.P. Spindle Motor**

**Fig. 4. (Right) Thompson Hydraulic Surface Grinder in which All the Coolant is Applied through the Grinding Wheel**



## Fosdick Drilling Machines and Jig Borers

### Booth 15

Sensitive radial drills in 3- and 4-foot sizes, designed for handling small work, are new developments of the Fosdick Machine Tool Co., Cincinnati 23, Ohio. In contrast to conventional designs, the arm of these machines is fixed in height, and the table moves up and down on the column. Both the arm and table can be swung a full 360 degrees around the column. This design enables the table to be placed in the proper position for any job, and should the work be large, the table can be swung back of the machine and the work placed on the base.

The column is of one-piece construction, and is 12 inches in diameter at the bottom and 8 1/2 inches in diameter at the top. The table, mounted on the column, is raised and lowered by hand or power. When power is used, the control for the motor is interlocked with the mechanism for clamping and unclamping the table. A key is fitted into the column to insure that the table is raised perpendicularly to the base.

Nine speeds and four feeds are obtainable, the speeds varying from 60 to 3500 R.P.M. in the ratio of 20 to 1. A serrated feed clutch, rapid traverse, two-speed ratchet handle for manual feed,

and semi-automatic tapping control are provided.

In addition to these machines, the company will show jig borers of improved design. Rapid power traverse of the table and slide in these machines is accomplished by a mechanism so designed that it is impossible to damage the measuring rods or the dial indicator; electric disconnect switches are connected to the control lever in order to interrupt the power to the traverse motor. A new type of indicator bracket and centralized and simplified controls for the nine speeds and eight feeds are among the improved features. One of the new machines is shown in Fig. 2.

Other new and improved machines to be exhibited include a simplified upright drill with speeds of from 37 to 600 R.P.M. or from 100 to 1600 R.P.M. and feeds from 0.002 to 0.010 inch or from 0.004 to 0.020 inch, which can be equipped with a jig borer table for both drilling and boring (Fig. 3); a new light line of radial drills with columns 11 inches in diameter and a radial arm 3, 4, or 5 feet in length, having a motor-actuated arm, electric clamping, and a wide range of feeds and speeds; and a standard

line of hydraulically controlled radial drills with columns from 13 to 19 inches in diameter, a clamping mechanism that is interlocked with the engaging of the feed clutch lever, and an automatic tool ejecting device.

A single-purpose sensitive drill capable of drilling up to 1 1/2 inches in cast iron, and a heavy-duty, round-table drilling machine also will be exhibited.

## Greenlee Drilling and Boring Unit

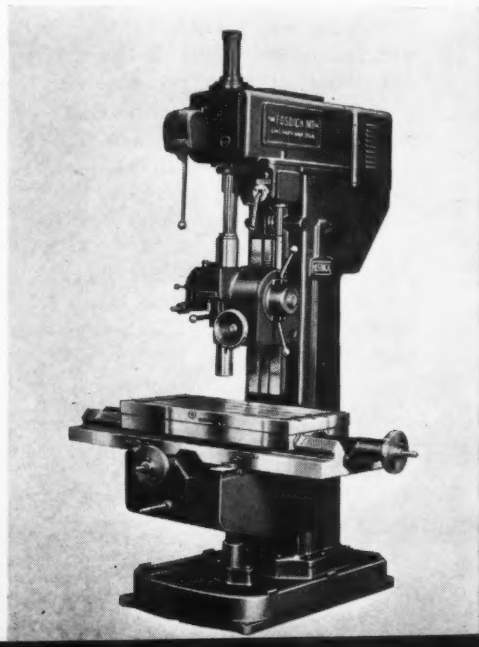
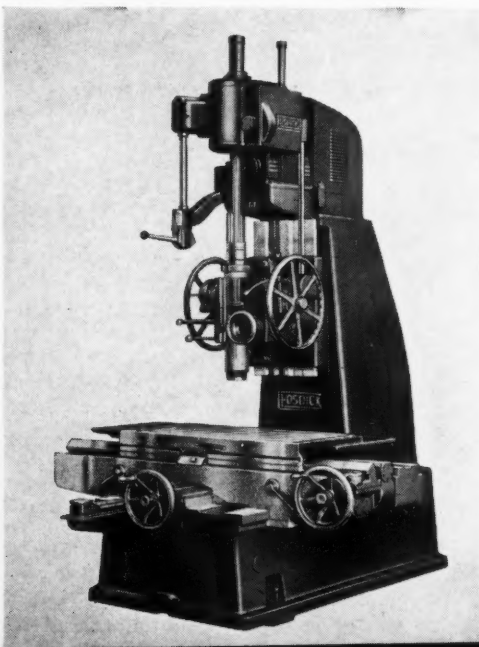
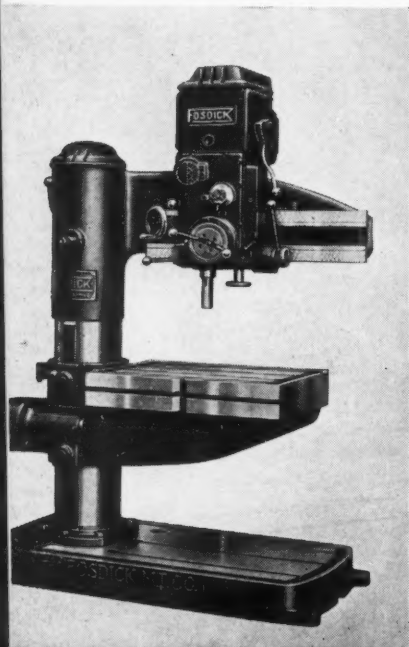
### Booth 53

Greenlee Bros. & Co., 1868 Mason Ave., Rockford, Ill. will exhibit a new compact hydraulic way type unit capable of handling a wide range of special drilling and boring operations. The outstanding feature of the unit is compactness of design. The compactness is accomplished by designing the ways with an over-all width of only 7 inches and by using a new Vickers hydraulic pump and control panel. The unit is driven by a single motor ranging from 2 to 5 H.P., and can be furnished with strokes from 18 to 30 inches without the use of auxiliary equipment. Functions include rapid approach, variable feed, delayed dwell, and a rapid return to the starting position.

Fig. 1. One of a New Line of 3- and 4-foot Radial Drills Made by Fosdick Machine Tool Co.

Fig. 2. Jig Borer with Rapid Power Traverse of Table and Slide, and Simplified Controls

Fig. 3. Fosdick Upright Drill that can be Equipped with a Jig Borer Table







*Men Responsible for Results  
in the Machine Tool Using Industries*



J. A. Hansen, Manufacturing Division Manager, Firestone Steel Products Co., Akron, Ohio



W. H. Schmid, Supervisor of Equipment Procurement, Bendix Products Div., South Bend, Ind.



Clarence Dunlop, Works Manager, Burroughs Adding Machine Co., Detroit, Mich.



R. O. Bullard, Engrg. and Mfg. Manager, Metallurgical Div., General Electric Co., Pittsfield, Mass.



Col. Burton O. Lewis, Commanding Officer, Ordnance Dept., Detroit Arsenal, Center Line, Mich.



Paul Kohler, Works Manager of the Toledo Scale Co., Toledo, Ohio



A. R. Fors, Vice-President, Manufacturing, Airtemp Div., Chrysler Corp., Dayton, Ohio

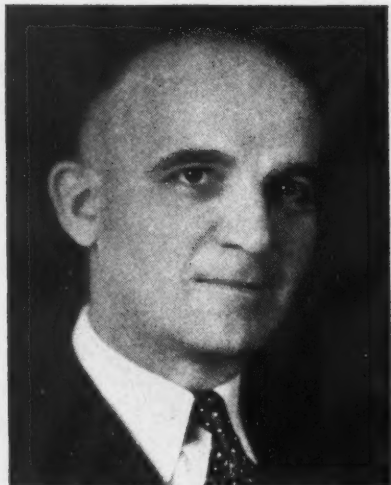


Donald S. Sammis, Vice-President, Underwood Corporation, Hartford, Conn.



Chas. W. Leguillon, Manager of Machine Design and Process Dev. B. F. Goodrich Co., Akron, Ohio

*Men Responsible for Results  
in the Machine Tool Using Industries*



Wm. F. Pioch, Director of Production Engineering, Rouge Plant, Ford Motor Co., Dearborn, Mich.



A. C. Ross, Works Manager, Worthington Pump & Machinery Corporation, Buffalo, N. Y.



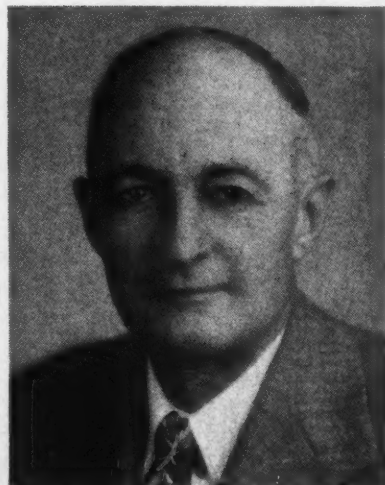
W. A. Ruhl, Works Manager, Universal Winding Co., Providence, R. I.



W. F. Knebusch, Works Manager, Harris-Seybold Co., Cleveland, Ohio



T. C. Downey, Works Manager, Oldsmobile Div., General Motors Corporation, Lansing, Mich.



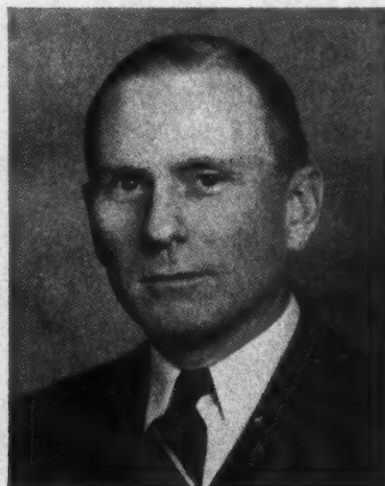
H. R. McDermott, Vice-President and Chief Engineer, Construction Machinery Co., Waterloo, Iowa



Milton L. Gearing, General Manager, New Departure Div., General Motors Corp., Meriden, Conn.



J. A. Anderson, Works Manager, AC Spark Plug Division, General Motors Corporation, Flint, Mich.



Paul L. Faulkner, Plant Superintendent, Kingston Products Corporation, Kokomo, Ind.





## MACHINE TOOL SHOW

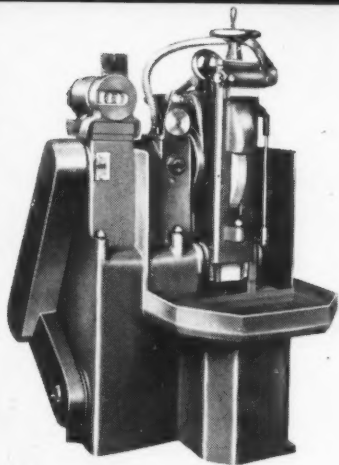


Fig. 1. (Left) Oliver 20-inch Tool-bit Grinder with Separate Templet Grinding Wheel

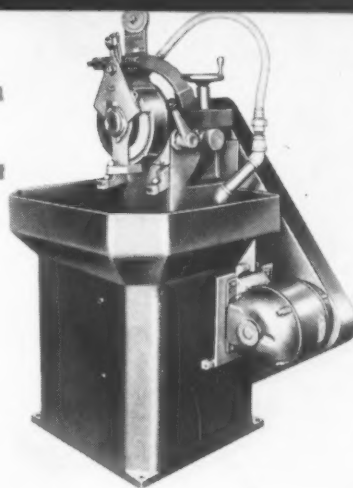


Fig. 2. (Right) Oliver Smaller Size Tool Grinder for Grinding or Polishing Single-point Tools

### Oliver Templet Tool-Bit Grinders

Booth 435

The Oliver Instrument Co., Adrian, Mich., has designed two tool-bit grinders for templet-controlled grinding of single-point tools, which will be on display at the Machine Tool Show. The larger machine, shown in Fig. 1, has a 20-inch grinding wheel with a 2-inch face, the grinding being done on the periphery of the wheel; a smaller wheel, driven by a separate motor, is built into the machine for making the templet. The salient feature of this machine is the tool-holder, which consists of an iron frame supported at the lower end by a heavy ball and socket joint and having a templet that is a double-sized replica of the tool point at its upper end. Midway between the templet and ball joint is a mortice, in which the tool is inserted; a setting gage permits the tool to be inserted so that the correct amount of metal is removed.

On the wheel guard are a ball joint and a straightedge, so arranged that when the tool-holder is placed in the working position, the tool will contact the wheel and the surplus material be ground off until the templet touches the straightedge. Once the templet is made and the tool inserted in the holder, no other adjustments or settings are required.

This machine will grind tools up to 1 1/2 inches wide by 1 3/4 inches high with from 0 to 20 degrees clearance. Special shapes, odd sizes, and various combinations of clearances can be ground in special tool-holders or adapters.

The second machine, illustrated in Fig. 2, is equipped with a 10-by 1 1/2-inch cup-wheel of the high-speed, silicon-carbide or diamond type. It was designed for finish-grinding and diamond-polishing turning tools and planer

and shaper tools. Only convex forms or shapes can be ground. The tool is held in a fixture that is manually operated, but guided by a templet. The 10-inch templet grinder will grind tools up to 1 inch wide by 1 3/4 inches high with from 0 to 20 degrees clearance. All angles and radii of the form can be ground with one setting and in one operation.

### Hall "Planatester" for Determining Toughness of Steels

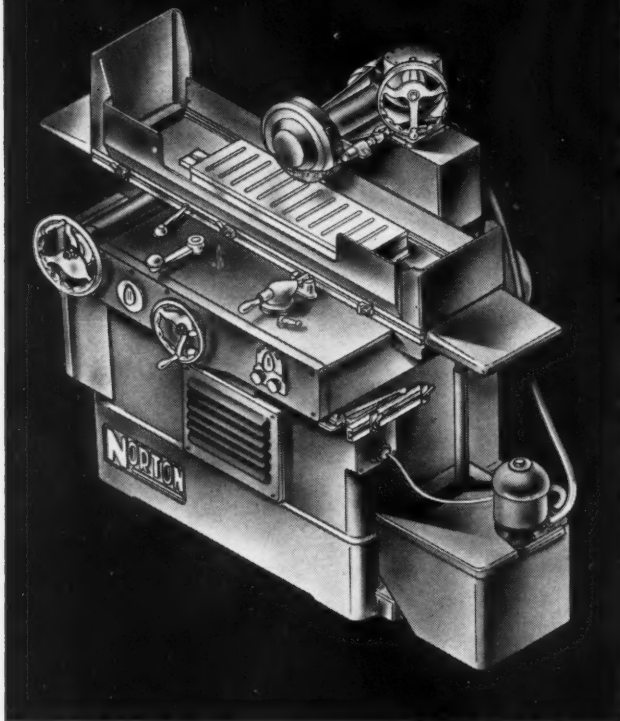
Booth 409

An instrument called the "Planatester," for determining the toughness of hardened steels, will be exhibited by the Hall Planetary Co., Fox St. and Abbotsford Ave.,

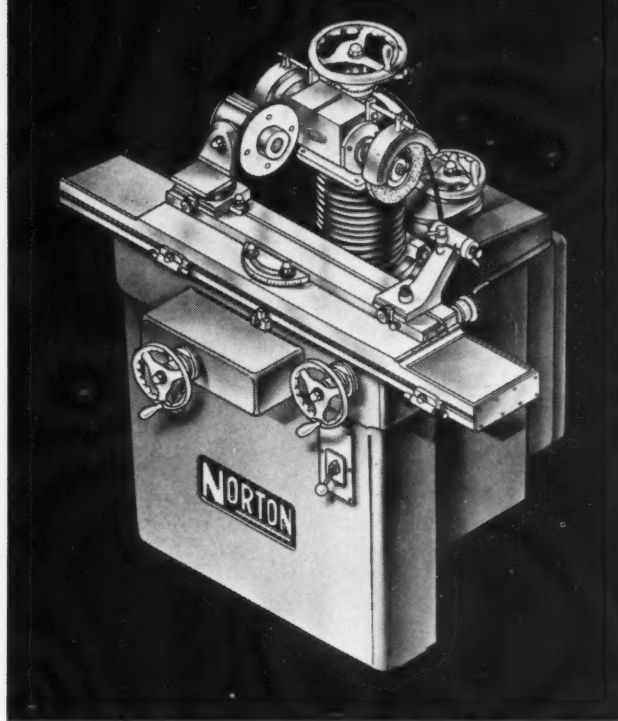


Philadelphia 29, Pa. It is designed principally for high-speed steel cutting tools, and is intended to be used in conjunction with a hardness testing machine. The high-speed steel cutting tools are tested after they have been hardened and before finish-grinding. Tools not coming up to the toughness standard can thus be corrected before they are finish-ground. A semicircular punch is used to shear a small segment of metal out of the tool to be tested, and the appearance of the sheared surface plus the pressure required to shear determines the toughness of the tool.

Hall "Planatester" for Determining Toughness of Hardened Steels



*Fig. 1. Norton 8- by 24-inch Surface Grinder Equipped with Automatic Hydraulic Cross-feed*



*Fig. 2. Cutter and Tool Grinder in which the Wheel-head can be Tilted and Swiveled*

## *New Grinders to be Shown by the Norton Company*

### **Booth 5**

The Norton Co., Worcester 6, Mass., will demonstrate a number of new developments in grinding machines. The 8- by 24-inch hydraulic surface grinder shown in Fig. 1 is arranged with horizontal spindle, hydraulic and hand table traverse, and automatic hydraulic cross-feed. The cross-feed can be operated with the work-table sta-

tionary to permit wheel truing. Both table traverse and cross feed handwheels automatically disengage during hydraulic operation.

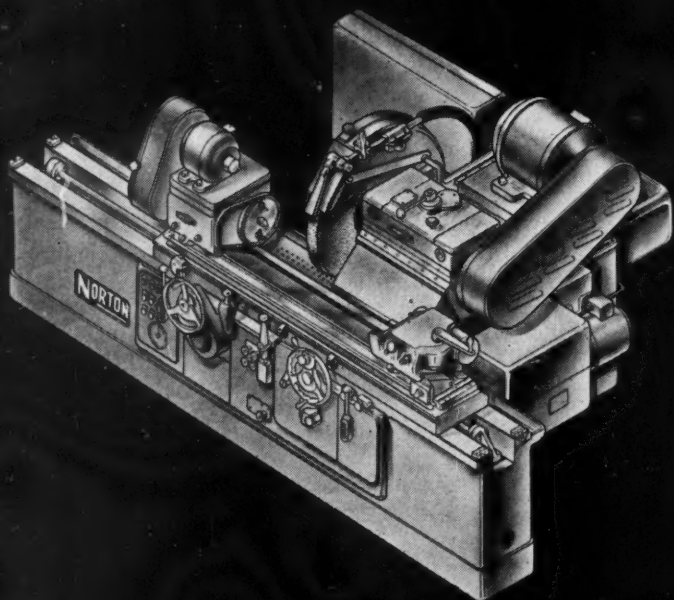
A feature of the No. 20 cutter and tool grinder (Fig. 2) is the wheel-head, which can be tilted up to 15 degrees each side of the horizontal. It can also be swiveled through 360 degrees. The table

is supported on a long row of steel balls.

Operating convenience, simplicity of controls and adjustments, accuracy of sizing, and accessibility of mechanisms are design features of the new 6- and 10-inch Type CTU cylindrical grinding machines. The 6-inch grinder is made in two lengths, taking 18 and 30 inches between centers. The 10-inch machine (Fig. 3) is available in six lengths, with distances between centers ranging from 18 to 120 inches. Hydraulic power table traverse with auto-

*Fig. 3. Type CTU 10-inch Cylindrical Grinder to be Exhibited by the Norton Co.*

*Fig. 4. "Seal-O-Lap" Lapping Machine for Finishing Parts up to 7 Inches in Diameter*



matic wheel feed, and adjustable table dwell control at each table reversal, are features of all machines. For extremely close tolerances, an automatic sizing device known as the "Nortonizer" is available.

The "Seal-O-Lap" lapping machine shown in Fig. 4 is capable of taking work up to 7 inches in diameter. It is arranged with an oscillating, rotating single work-drive spindle and a rotating lower lap-drive spindle. A wet lapping attachment can be supplied. The lap is mounted on a spring-loaded vertical spindle. The work-spindle is carried in a sliding quill, and through an adjustment feature on the over-arm, can be accurately aligned perpendicular to the lap face. The over-arm is oscillated by an independent vertical reductor. The upper spindle quill is raised by a capstan head for loading. The work is frictionally driven and is slowly oscillated and rotated across the lap face.

The No. 2 Bura-Way tool grinder (Fig. 5) is designed for grinding convex single-point tools. Model or master tools can be made by using the protractor and angle-setting attachments. Templets are made from these master tools by the use of a calibrating block and templet grinding step block. The universal tool bit holder can be rolled and tipped to an angle and is arranged so that the tool can be fed toward the wheel in incre-

ments of thousandths of an inch. Relief angles up to 15 degrees, side rake angles (positive or negative) up to 30 degrees, and back rake angles (positive or negative) up to 25 degrees can be ground.

The No. 12 Simplex surface finishing machine (Fig. 6) has a capacity for work ranging from 1/2 inch to 2 1/2 inches in diameter, with lengths up to 12 inches. The machine can be equipped to finish several bearings simultaneously by supplying the required number of lapping arms. The lapping arms are operated automatically with a positive toggle type shoe clamping device. The machine is pneumatically actuated, and is provided with a control valve that automatically governs the loading and unloading cycle. The time cycle for actual finishing is controlled by an adjustable timer.

The No. 2 Cam-O-Matic is an automatic, hydraulic cam-contour grinder. The operating cycle is completely automatic, including the grinding of all contours, the indexing of work-table and master cam roller, and the truing of the grinding wheel. Three sizes are available, with distances between centers of 26, 30, and 40 inches and a 5-inch diameter swing. The V-belt work drive is designed to provide a smooth, gradual automatic work speed reduction that insures fine finishes. An automatic wheel-truing device com-

pensates for the diamond feed, while a micrometric adjustment regulates diamond wear.

The No. 16 FC universal lapping machine has a capacity for flat work up to 3 inches thick by 4 inches long, and for cylindrical work 1 inch in diameter by 5 inches long. Two cast-iron laps are employed. The upper lap rotates in contact with the lower one. The surfaces of the laps can thus be dressed without removing them from the machine. The upper lap is free to float and adjust itself to the work. The lower one can be rotated or used in a stationary position. The work-holder drive-shaft imparts the motion necessary for either flat or cylindrical lapping. The work-holders are not positively driven, but serve to guide the work as it rolls between the lap faces in a non-radial path. A rotating eccentric guide pin causes the work-holder to gyrate and impart a sliding motion to the work as it rolls.

A new 10- by 20-inch universal grinding machine is designed for miscellaneous general production or tool-room work. Interchangeability of belts in the wheel-head permits mounting a cylindrical grinding wheel on either end of the work-spindle. Rotation of the wheel-head through 360 degrees is provided. Special truing speed, picker feed, and dwell control are features. Headstock speed changes are obtained electronically.

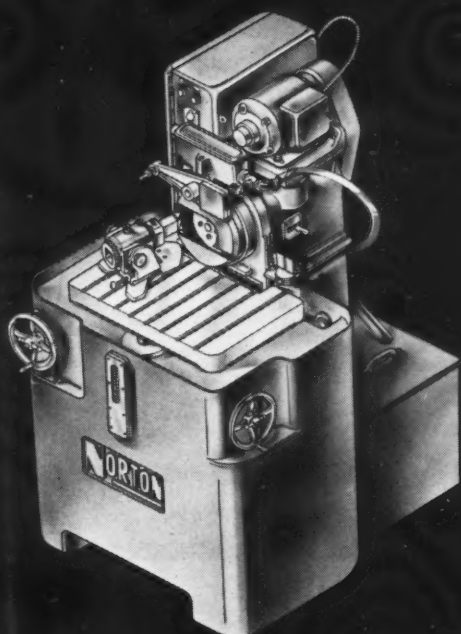
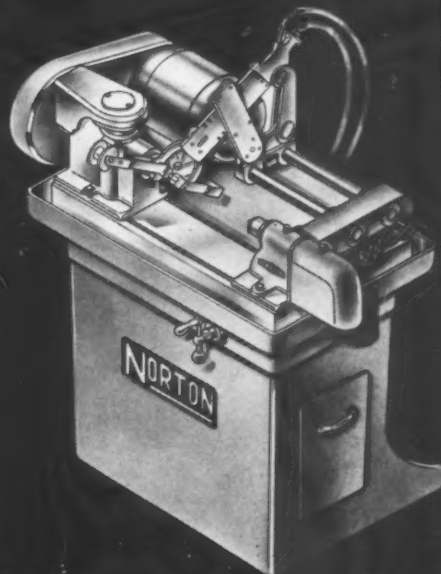
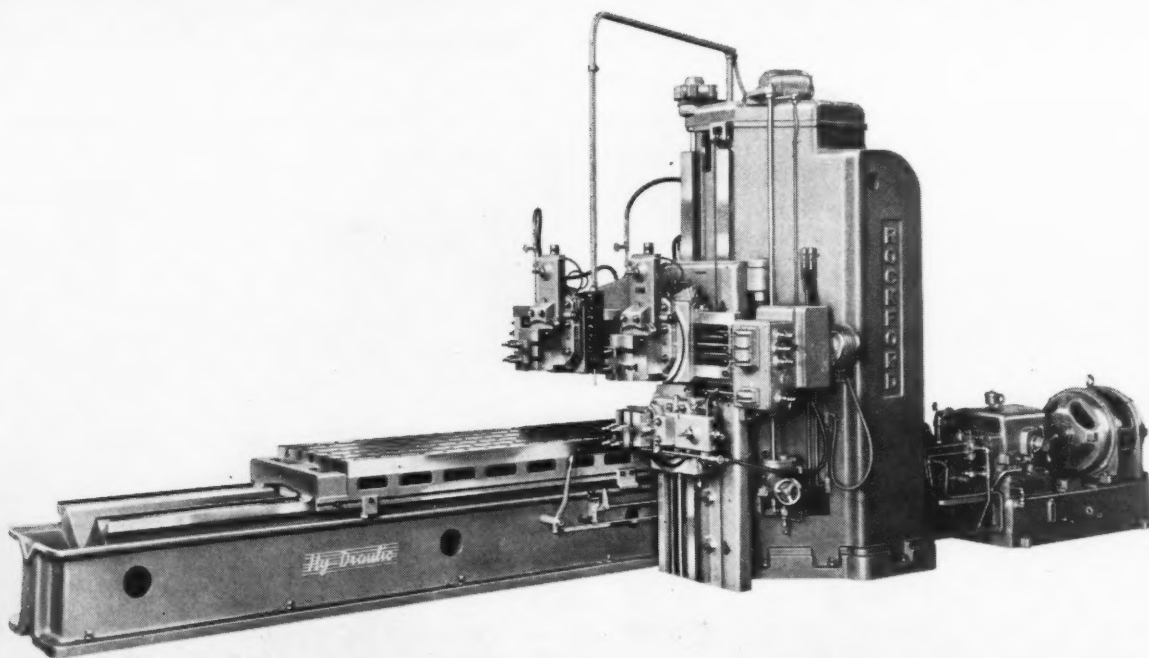


Fig. 5. (Left) Bura-Way Tool Grinder for Convex Single-point Tools

Fig. 6. (Right) Pneumatically Operated Simplex Surface Finishing Machine





## *Rockford Hy-Draulic Planers, Shapers, and Slotters*

**Booth 526**

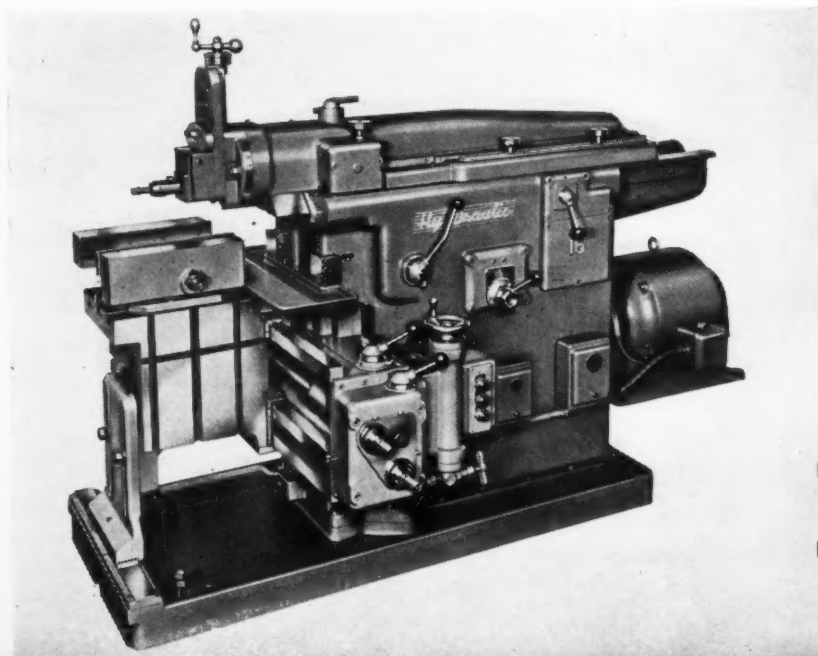
The bed, table, and column members of the Hy-Draulic double-housing and open-side planers to be introduced at the Show by the Rockford Machine Tool Co., Rockford, Ill., have been completely redesigned to provide heavier cross-sections so as to insure rigidity under all working conditions. The planers are available in four sizes, each of which has six maximum lengths of stroke, from 10 to 20 feet. An open-side planer of this design is shown in Fig. 1.

The new ram type shaper (Fig. 2) is heavier and more rigid than previous designs.

Added strength has been provided by increasing the cross-section of the rail and table. Heavier cuts can now be taken without affecting the parallelism between the stroke of the ram and the established horizontal plane of the work surface. The shapers are built in six sizes with strokes ranging from 12 to 28 inches. Improvements have also been made in the hydraulic circuit. The Hy-Draulic drive permits cutting a keyway  $1/2$  inch in length where a clearance of only 0.008 inch is allowed at the blind shoulder at each end of the work.

The column and rail of the new 36-inch open-side shaper have been redesigned to provide increased rigidity. Power rail elevation is available as extra equipment. Controls are in duplicate, mounted on each side of the bed. Safety devices incorporated in the stop and start lever assemblies prevent accidental starting of the table.

By means of a dual cylinder assembly, installed as extra equipment, cutting speeds up to 240 feet per minute can be provided on the new Hy-Draulic shaper-planers. An unusual feature of this dual assembly is that it provides three cutting pressures without requiring a change in the horsepower output of the hydraulic system. At low speed, this system provides a cutting pressure up to



**Fig. 1. (Above) Rockford Hy-Draulic Open-side Planer with Bed, Table and Column Members Redesigned to Provide Greater Rigidity**

**Fig. 2. (Left) Ram Type Shaper of Increased Strength and Rigidity Made by the Rockford Machine Tool Co.**



**Fig. 1. (Right) Proficorder for Checking Surface Irregularities of Ground or Machined Parts**

**Fig. 2. (Left) Rotary Piloting Fixture Used with a Profilometer to Measure the Surface Roughness of Cylindrical or Circular Parts**



three times that of the conventional single-cylinder assembly without increasing the horsepower requirements. The machines have been structurally redesigned to provide the required rigidity for

the increased speeds and cutting pressures.

Hy-Draulic slotters with 36- and 48-inch strokes, described in May, 1947, *MACHINERY*, will also be displayed.

work is held stationary while the tracing point is moved mechanically over the surface measured.

Besides these instruments a race tester for measuring the surface waviness of ball and roller bearing races and an Anderometer for checking the over-all quality of assembled ball bearings will be on exhibit.

## ***Surface Checking Instruments to be Shown by Physicists Research Co.***

**Booth 563**

A mechanical-electronic shop instrument that provides a magnified chart record of the shape, height, and spacing of surface irregularities will be displayed by the Physicists Research Co., 321 S. Main St., Ann Arbor, Mich. This instrument, called the "Proficorder," is designed to show waviness, bows, steps, and other surface irregularities spaced about 1/32 inch apart or farther. In machining and grinding applications, the primary function of the instrument is to show irregularities caused by the machine or set-up, rather than the roughness resulting from the cutting action of the tool or wheel. However, small roughness irregularities also can be recorded in detail. The maximum length of tracing is approximately 2 inches.

Another of the company's exhibits is a rotary piloting fixture for circular tracing with a Profilometer. This unit provides for

making micro-inch surface roughness measurements of cylinders, spheres, and toroids, and of circular flat surfaces such as rings, grooves, and bosses. It permits tracing on surfaces from 1/16 inch to 10 inches in diameter (internal or external) and accommodates work to 10 inches high. The

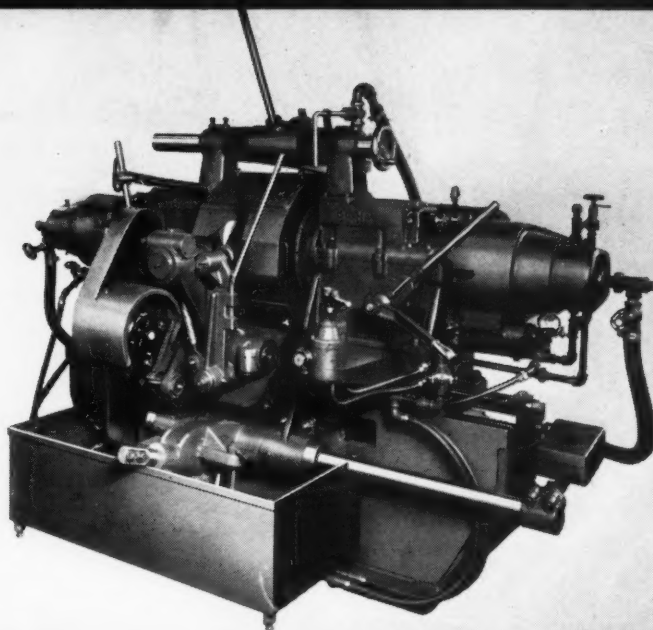
***Fine-pitch Gear Generator Designed by the Illinois Tool Works for the Production of Small Gears***

## ***Illinois Fine-Pitch Gear Generating Machine***

**Booth 302**

A gear generating machine that was designed primarily to produce fine-pitch involute gears of either spur or helical types, but that can also be used for gener-





ating any ordinary tooth form, will be exhibited by the Illinois Tool Works, Chicago, Ill.

Employing a unique full generating process, the machine combines the outstanding advantages of both the shaping and hobbing methods of gear production. Extreme tool simplification contributes largely to the accuracy of finished work and to economy of operation. The new machine will produce gears up to 3 inches in diameter over a 30 to 200 pitch range. Adaptable to semi or fully automatic magazine feeding, it will handle blanks or stacks of blanks up to 3/4 inch thick.

Charles H. Besly & Co., 118-124 N. Clinton St., Chicago 6, Ill., will exhibit several new grinders, including Model No. 5 15-inch and 18-inch L type dry grinders (Fig. 1). The directly connected abrasive disks of these machines are driven by a 3-H.P., 1750-R.P.M. motor. Both right- and left-hand geared-lever feed tables are provided. Designed for tool-room work and light manufacturing, these grinders accommodate abrasive disks up to 1 inch thick

## New Besly Grinders

Booth 275

and 15 or 18 inches in diameter.

The No. 218 20-inch double-spindle wet grinder shown in Fig. 2 is tooled for simultaneously grinding both sides of circular saw blades, clutch and valve disks, etc. The work is mounted on an arbor and rotated by means of a side driving roll. The rotating grinding wheels, 20 inches in diameter, are brought toward the work by hydraulic feed. A production of about sixty 8-inch saw blades can be ground per hour, removing approximately 0.008 inch per side.

A vertical-spindle wet grinder with rotary feed (Fig. 3) is equipped to grind cast-iron gear covers at the rate of 250 per hour. The operator simply places the castings in the fixture of this No. 372 machine, and removes ground parts after they have completed one revolution around the 52-inch diameter wheel.

*Fig. 1. (Above Left) Besly Motor-driven Disk Grinder for Light Manufacturing or Tool-room Use*

*Fig. 2. (Above Right) Double-spindle Wet Grinder Designed to Finish Thin Cylindrical Parts*

*Fig. 3. (Left) Vertical-spindle Wet Grinder Set up for Finishing Gear Covers*







*Men Responsible for Results  
in the Machine Tool Using Industries*



T. F. Birmingham, Vice-President, The Superheater Co., East Chicago, Ind.



H. A. Squires, Manufacturing Engineer, Bucyrus Erie Co., South Milwaukee, Wis.



J. J. Smith, Manager at Schenectady, American Locomotive Co.



M. W. Kotarba, Works Manager, Chisholm-Ryder Co., Inc., Niagara Falls, N. Y.



Fred J. O'Brien, Works Manager, of R. Hoe & Co., Inc., New York, N. Y.



Arthur A. Merry, Chief Tool Engineer, Pratt & Whitney Aircraft, East Hartford, Conn.



G. T. Willey, Vice-President of Manufacturing, The Glenn L. Martin Co., Baltimore, Md.



B. Bronzan, General Manager, Baash-Ross Tool Co., Los Angeles, Calif.



George R. Worner, Superintendent, Taylor Instrument Companies, Rochester, N. Y.

*Men Responsible for Results  
in the Machine Tool Using Industries*



R. O. Greenshields, Works Manager, Wheel Div., The Budd Co., Detroit, Mich.



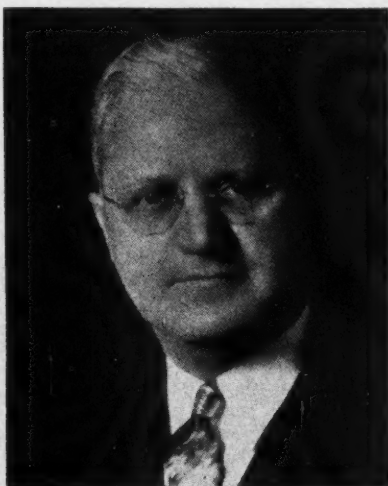
R. Hannah, Engineering and Mechanical Div. Manager, The Murray Corporation of America, Detroit



Fred C. Pyper, Master Mechanic, Buick Motor Div., General Motors Corporation, Flint, Mich.



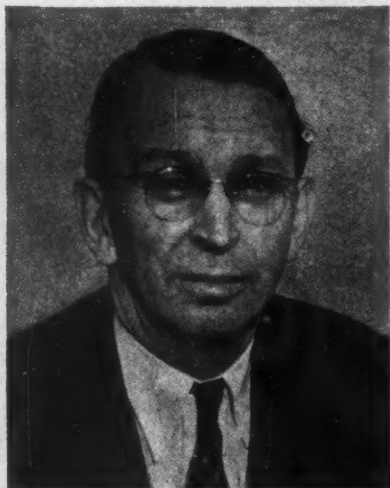
G. P. Grace, Vice-President, Manufacturing, Robertshaw Thermostat Co., Youngwood, Pa.



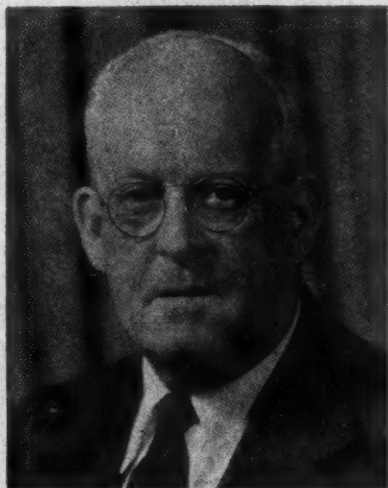
H. W. DeBruin, Vice-President, Manufacture, Jeffrey Mfg. Co., Columbus, Ohio



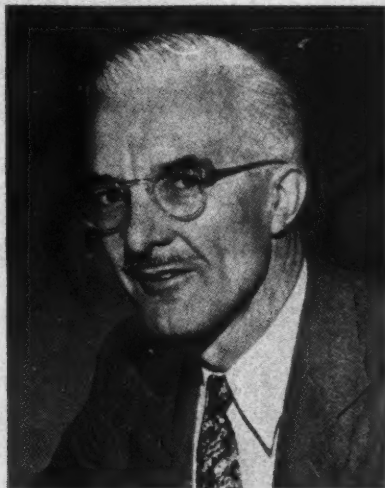
Frank M. Martin, Mechanical Superintendent, Royal Typewriter Co., Inc., Hartford, Conn.



Joseph G. Rayniak, Vice-President, Manufacturing, Johnson Motors, Waukegan, Ill.



C. Albert Hanson, Superintendent Mechanical Equipment, Yale & Towne Mfg. Co., Stamford, Conn.

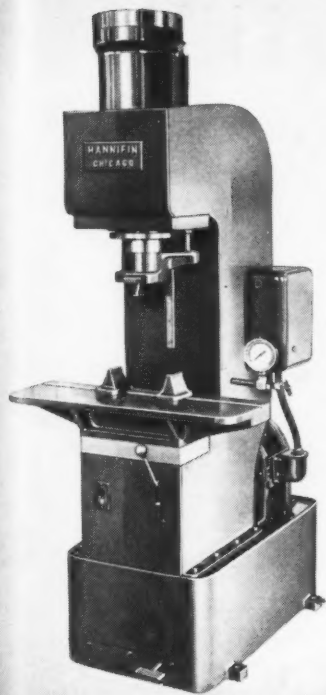


Charles E. Phillimore, Vice-President, Manufacturing, Bell & Howell Co., Chicago, Ill.



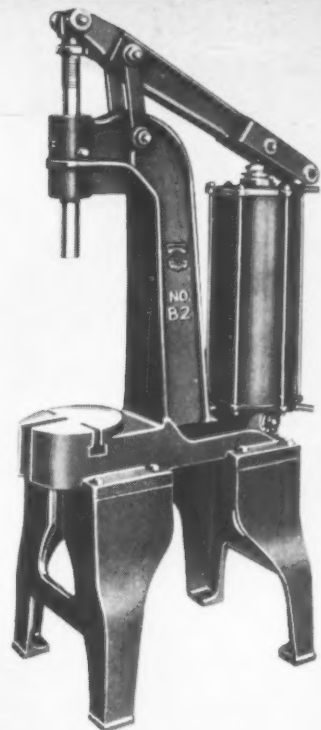


## MACHINE TOOL SHOW



**Fig. 1. (Left) Hannifin 25-ton Hydraulic Press for Straightening Shafts and Spindles**

**Fig. 2. (Right) Hannifin Pneumatic Press for Fitting Work on Arbors**



### Hannifin Hydraulic and Pneumatic Equipment

Booth 411

A wide line of hydraulic and pneumatic power and production equipment will be exhibited at the Show by the Hannifin Corporation, 1101 S. Kilbourn Ave., Chicago 24, Ill.

The 25-ton hydraulic straightening press seen in Fig. 1 is designed for use in the manufacture of crankshafts, camshafts, axles, lathe spindles, gear-shafts, and other parts that are machined, heat-treated, and then ground. By straightening or truing these parts after heat-treating, grinding time is held to a minimum.

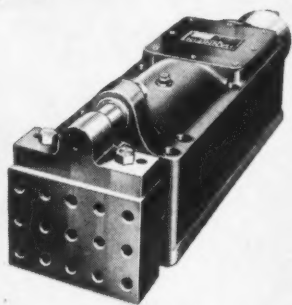
The pneumatic arbor press

shown in Fig. 2 is a standard type of Hannifin air-powered unit used for pressing operations, such as the fitting of lathe work on arbors.

A hydraulic multiple piercing unit (Fig. 3) is designed for punching a number of holes simultaneously in structural members prior to the assembly of other parts by bolting or riveting. It is adaptable to modern volume production work where quantities of duplicate parts must be produced.

The 35-ton portable hydraulic riveter illustrated in Fig. 4 is a yoke type unit for cold or hot riveting work on automobile frames, structural steel, and other shop fabricated work. This type of riveter is distinguished for its noiseless operation and the speed with which rivets can be headed. Improved riveting can be obtained with the hydraulic "squeeze" action in combination with cold rivets.

**Fig. 4. (Right) Portable Hydraulic Riveter of 35 Tons Capacity for Cold or Hot Riveting Work**



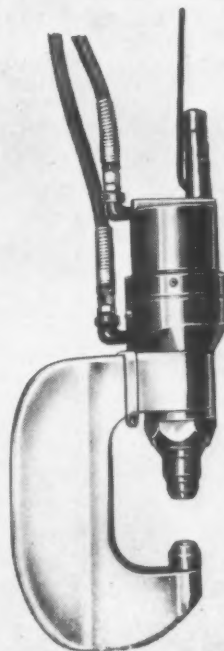
**Fig. 3. Hydraulic Multiple Piercing Unit**

### Gardner Grinders

Booth 429

Two new flat surface grinding machines of advanced design will be featured by the Gardner Machine Co., Beloit, Wis. One machine is a special double-spindle high-production grinder, equipped with a "feed-through" type of fixture, so that parts having parallel surfaces will constantly pass between the opposed abrasive members.

The other machine—a single-head grinder—is equipped with a power-operated oscillating worktable. The grinding head is mounted on a power-actuated slide. Other features include dial indicators for head in-feed and remote-control head-feed.





**Fig. 1. (Left) Cincinnati Dual Power Dial Plain Horizontal Milling Machine**



**Fig. 2. (Right) Cincinnati Vertical Style Dual Power Dial Milling Machine**

## *Cincinnati Milling Machines and Grinders*

**Booth 306**

A new line of knee-and-column type milling machines incorporating numerous features of value in handling heavy milling operations will be exhibited by the Cincinnati Milling Machine Co., Cincinnati 9, Ohio. These machines—the “dual power” and “high power” dial types—are built in Nos. 5 and 6 sizes. The high power dial types are available in plain, universal, and vertical styles, while the dual power machines are built in plain (Fig. 1) and vertical (Fig. 2) styles only. Square-gibbed bearing ways on the column and top of the knee and a rectangular over-arm with built-in vibration dampener and full-length taper gib clamping are features of these machines.

The dual power machines have two ratings for the horsepower available at the spindle. For example, the 50-H.P. motor can deliver its full capacity while the machine is running at any one of

eighteen spindle speeds from 45 to 1400 R.P.M. Through automatic controls within the column, the same motor delivers 25 H.P. at the six low spindle speeds of 14 to 37 R.P.M. Speeds and feeds are changed by power. The spindle drive clutch is engaged and disengaged hydraulically.

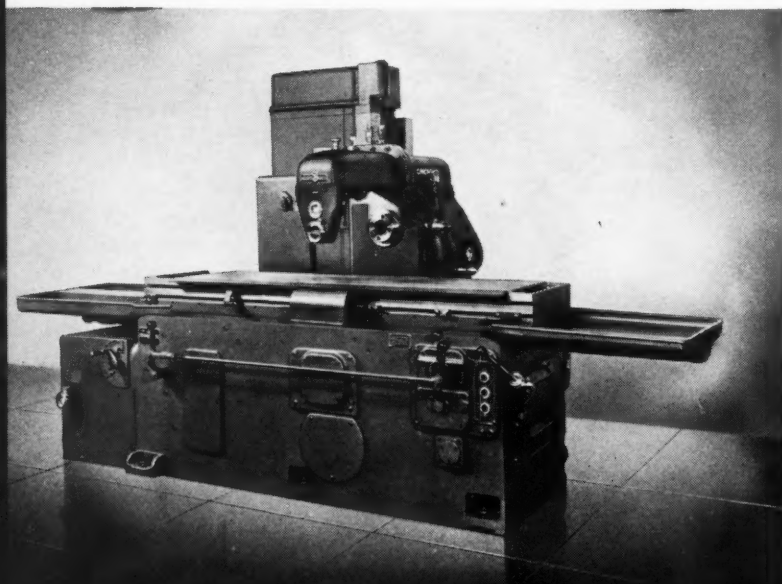
Other features include automatic table feed cycles. Various combinations of feed and rapid traverse at the rate of 150 inches per minute, with automatic reverse and return to the starting point, can be obtained. Cross and vertical hand-control cranks automatically disengage when their respective power feeds are engaged. When coolant is employed, it returns to the reservoir in the base through the space between two sets of telescoping tubes around the vertical screw, thus eliminating conventional coolant return tubes.

The new tracer-controlled Hydro-

matic milling machines (Fig. 3) are essentially heavy-duty production type milling machines to which has been added a sensitive, tracer-controlled vertical movement of the spindle-carrier. The operating cycle is automatic, including the duplication of master profile-templets. The machines are built in both plain and duplex styles, and in twelve sizes, with table travels ranging from 24 to 90 inches.

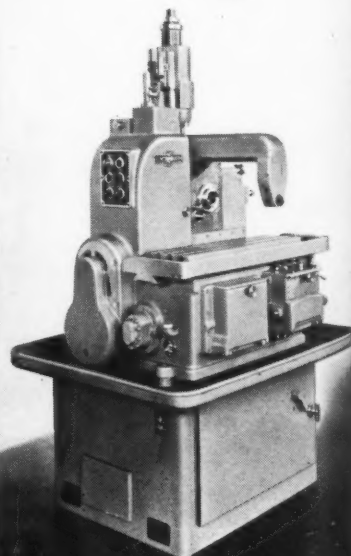
The No. 0-8 plain automatic milling machine (Fig. 4) has completely automatic table-operating cycles. The machine can be provided with a hydraulic rise and fall movement of the spindle-carrier, which is automatically synchronized with the table movements. Cycles are quickly changed by means of pre-set camshafts.

The No. 0 Filmatic centerless grinder (Fig. 5), a recent addition to the line of centerless machines made by Cincinnati Grinders, Inc., Cincinnati 9, Ohio, is designed for small precision ground work. The grinding capacity is from 0 to 1/2 inch diameter, 5



**Fig. 3. (Left) Tracer-controlled Hydro-matic Milling Machine**

**Fig. 4. (Right) Plain Milling Machine with Automatic Table Operating Cycles**





**Fig. 5. (Left) Cincinnati Filmatic Centerless Grinder for Work to 1/2 Inch Diameter**



**Fig. 6. (Right) Filmatic Hydraulic Universal Grinder to be Shown by Cincinnati Grinders, Inc.**

inches length for through feed, and 4 inches length for in-feed work.

A new Filmatic 10-inch hydraulic universal grinding machine (Fig. 6) is available as a precision tool-room grinder or a production grinder with universal features. The machine is built in 24-inch length only. A hinged internal grinding unit at the front of the wheel-head remains in place during conventional traverse or in-feed grinding operations. Being individually driven, this internal unit can be quickly set to grinding position.

Speed changes are effected through an electronic control unit, built into the headstock, which converts alternating to direct current. A jog button permits the operator to stop the faceplate or chuck in the most advantageous angular position for loading and unloading the work. Table traverse is hydraulically actuated and infinitely variable from 3 to 280 inches per minute. Coolant flow and headstock spindle rotation

automatically start and stop with the table traverse. An internal mounted trip-out dog stops the pick feed action approximately 0.001 inch before the cross-feed micrometer dial reaches its zero graduation. Final sizing is then accomplished by rotating the hand-wheel to a positive stop. A mer-

cury float switch, connected to the electrical circuit, stops the grinding wheel motor if the oil level recedes below the safe limit. The way lubricating and hydraulic systems are interconnected. Hydraulic in-feed with hand control or automatic in-feed can be built into the machine.

## *Lehmann Hydratrol Lathes*

**Booth 268**

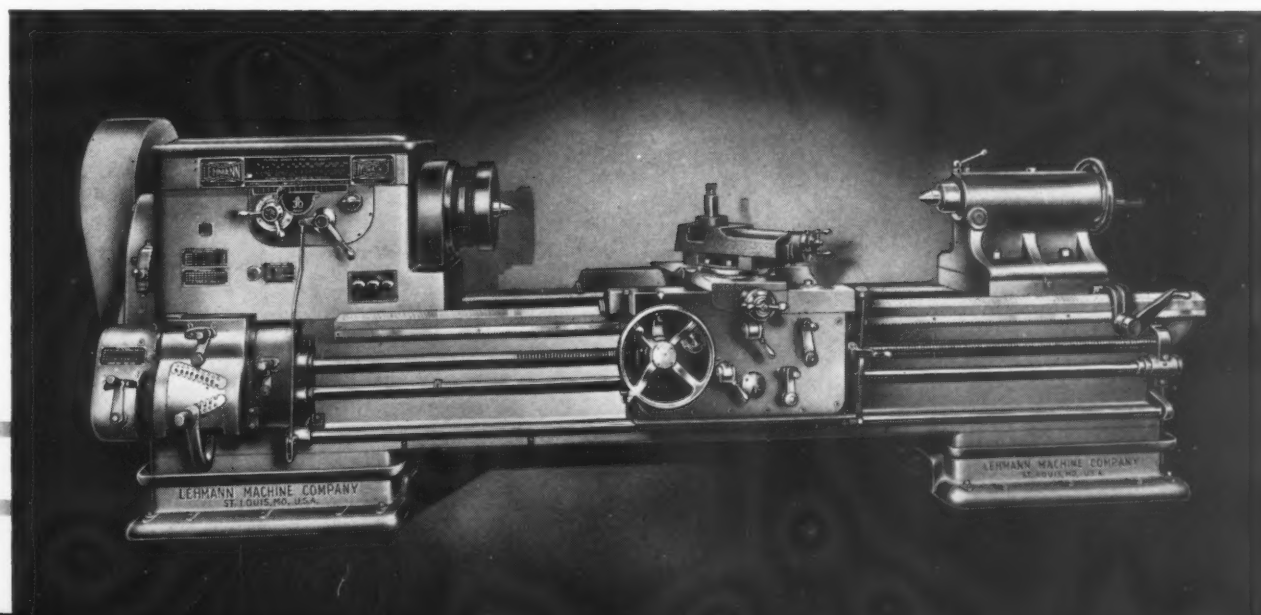
The Lehmann Machine Co., St. Louis 3, Mo., will exhibit a 16- and 18-inch Electronic-Hydratrol lathe that operates at constant horsepower over a range of spindle speeds from normal minimum to 1800 R.P.M. Among its construction features is a steel bed with hardened raceways for pre-loaded roller-bearing carriage, taper attachment and cross-slide.

A 30-inch hollow-spindle Hydratrol lathe in which is incorporated a modified automatic safety relay and a hydraulically controlled

rapid-traverse mechanism also will be shown. The automatic safety relay makes possible the changing of spindle speeds without stopping the spindle, and avoids harmful clash of the positive clutches. Speeds can be changed from the highest to the lowest, or vice versa, with one movement and without dwell.

Two hydraulic brakes, one on the spindle and the other at the primary power source, permit instantaneous stopping and "inching," even with large work.

### *Lehmann 30-inch Hollow-spindle Hydratrol Lathe*



## *Geargrind Universal and External Grinders*

Booth 670

The universal oscillating grinder illustrated, which was developed by the Gear Grinding Machine Co., 3901 Christopher Ave., Detroit 11, Mich., for finishing spherical, conical, and cylindrical surfaces on small parts, will be exhibited for the first time at the Show. Step sheaves in the work-head V-belt drive make available three speeds—110, 230, and 360 R.P.M. The work-head spindle can be equipped with collets, chucks, or faceplates. Adjustments are provided to allow the work-head to be positioned parallel and normal to its axis of rotation.

For spherical surfaces, the work-head is mounted on a table which can be oscillated by hand through a 180-degree arc or by power through an arc length of 0 to 90 degrees. As soon as the motor current is cut off, a brake is released to quickly stop its rotation. The oscillating drive can be disconnected when desired. The work-head can be set to an exact angle by using a sine bar and locked in place. A fluid seal is employed to prevent grit-laden air from getting into the bearing.

Air for power movement of the grinding wheel carriage is passed through a filter, lubricator, and pressure regulator, to a manual control valve. The operator can start or stop the grinding wheel carriage reciprocation at any

time. When the air is shut off, the grinding wheel carriage can be freely moved by hand. During automatic reciprocation, the speed is controlled by a cam. Carriage travel is controlled by turning a large handwheel. On top of the carriage are two additional slides, both screw- and nut-actuated. One slide moves the grinding wheel spindle parallel to the carriage travel, and the other moves it normal to the carriage travel.

Another machine exhibited—the Type GG-10 by 24 automatic gear grinder—is equipped with an automatic grinding wheel feed,

which can be adjusted for number of feeds and rate of feed. It will grind gears up to 10 inches in diameter by 10 inches face width having from 4 to 110 teeth with diametral pitches from 32 to 4. A double column supports the grinding-wheel head. The work, mounted between centers or on a stub arbor, reciprocates past the grinding wheel at speeds up to 70 feet per minute. After the preset amount of down feed, in grinding one tooth, the work travels on an extended stroke to clear the grinding wheel, permitting automatic indexing of the work and resetting of the grinding wheel. Automatic wheel feed for truing is also provided. The spindle is set up to handle two grinding wheels.

## *American Lathes and Radial Drills*

Booth 57

Important design and structural improvements have been made in the "Hole Wizard" radial drill shown in Fig. 1, which is made by the American Tool Works Co., Cincinnati 2, Ohio. This machine has a 5-foot arm and a 15-inch diameter column. The new arm elevating mechanism incorporates provision for oiling the elevating and safety nut automatically each time the arm is raised. The arm girdle which fits the column sleeve is now provided with automatic oiling actuated by the clamping mechanism, and is further im-

proved by wipers at top and bottom. The danger of scoring is thus reduced to a minimum.

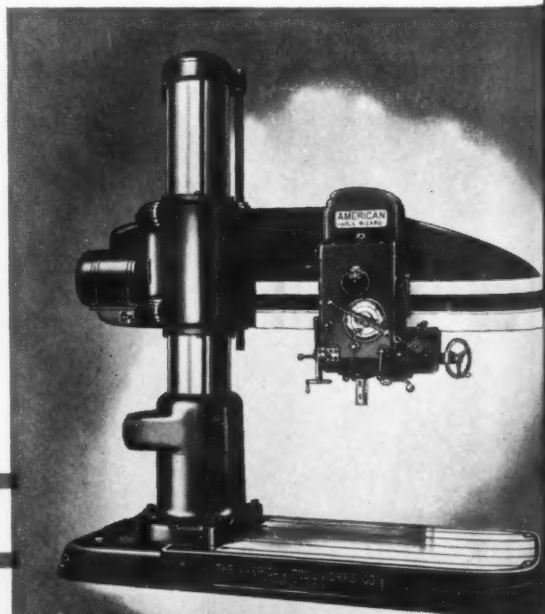
A new 25-inch Pacemaker lathe (Fig. 2) will be seen for the first time at the Show. This lathe has power and speed range sufficient to utilize carbide cutting tools to the limit of their capacities.

Three types of heads are provided: 27-speed (6 to 600 R.P.M.) and 18-speed (7 to 600 R.P.M.) for constant-speed motor drive, and 9-speed (6 to 750 R.P.M.) for two-to-one, adjustable-speed, direct-current motor drive. An elec-



(Left) Geargrind Universal Oscillating Grinder for Finishing Spherical, Conical, and Cylindrical Surfaces

Fig. 1. (Right) American "Hole Wizard" Radial Drill of Improved Design



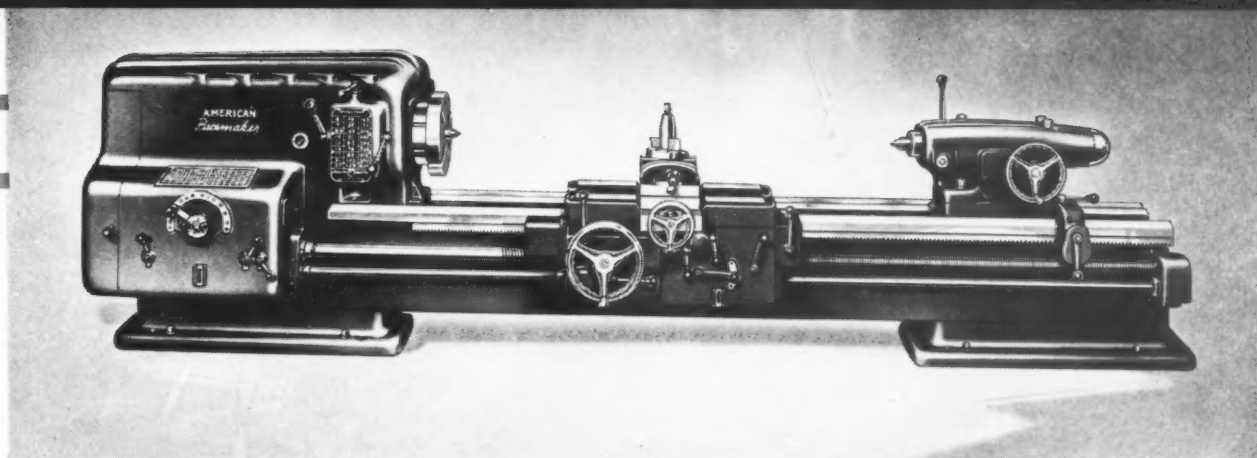


Fig. 2. New 25-inch Lathe Added to American Pacemaker Line

trical spindle control provides push-button start, stop, and brake from the apron, and a jog button on the head facilitates speed changing. A full-magnetic, reversing type control provides reverse from the apron when alternating-current is used.

The totally enclosed quick-change gear mechanism provides a range of sixty threads, from 1/2 to 30 threads per inch, and feeds from 0.004 to 0.240 inch per revolution. A direct-reading index-plate facilitates thread and feed selection. The apron has a hardened steel transmission and positive longitudinal and cross-feed clutches for finger-tip control.

A new hydraulic shaft-duplicating lathe (Fig. 3) has been developed primarily for rapidly and accurately reproducing circular shafts from a templet. This lathe also cuts metal at the speeds and feeds recommended for carbide tools. It is built in 16-, 18-, 20-, 25-, and 32-inch sizes. Multiple tool set-ups are eliminated, and continuous cutting is possible.

An 18-inch American lathe, also to be displayed, is a new addition to the "Pacemaker" line. It can be furnished either in the standard or the precision tool-room type. Three speed ranges can be provided. Each range permits eighteen or twenty-seven spindle speeds in geometric progression,

with suitable speeds for all classes of work. The front and center spindle bearings are adjustable by thousandths of an inch from the

outside of the head. The head mechanism is automatically oiled with clean filtered oil by a pump circulating system.

## Heald Bore-Matics and Grinders

### Booth 511

Three new lines of machines—Bore-Matics and internal and surface grinders—will be exhibited by the Heald Machine Co., Worcester 6, Mass. The operation of all these hydraulic machines has been made independent of oil temperature. Motors and pumps have been moved off the machines to avoid vibration and to keep warm oil out of contact with the base. Improved idlers, cylinders, automatic way lubrication, and refinements in hydraulics give smooth table motion. Wheel-heads, work-heads, and boring heads are permanently lubricated and sealed. The heat rise has been cut approximately in half, reducing heat distortion to a minimum.

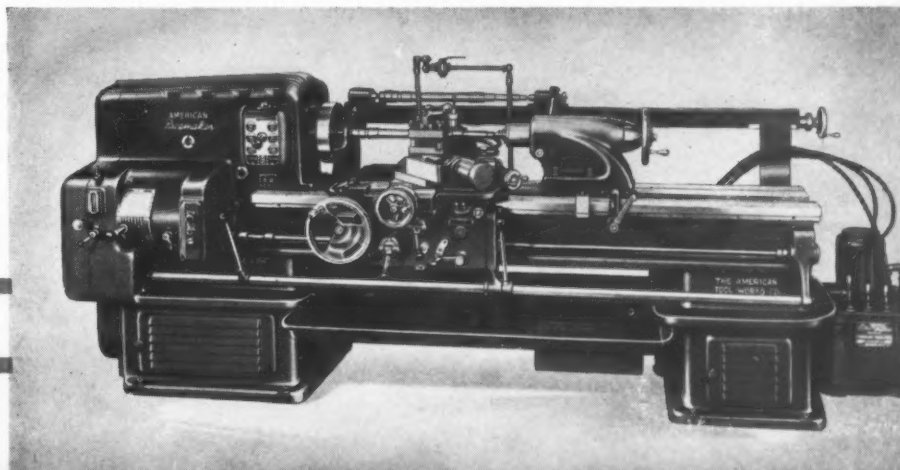
Additional features of the Bore-Matic line are elimination of swinging latches, fast table traverse that accelerates while traversing, and the use of large idlers to increase V-belt life. The improved hydraulic system circulates only the amount of oil needed. New Bore-Matics can be

equipped for two-way boring with different feeds in two directions.

Another feature of the internal grinders is a high-frequency wheel-head capable of running at high speeds and of taking heavy cuts. The new feed mechanism is arranged so that the rates and amount of roughing and finishing feeds, as well as the amount of retraction, compensation, and rapid approach are set by turning graduated knobs. An indicator shows when the belt tension is correct. A sealed, wheel-truing unit permits short wheel-spindles.

In the surface grinders, the wheel-spindle is carried on a column and the chuck table rests solidly on the ways of the base. The ways are well covered, overhang is small and constant, and wheel pressure cannot lift the ram. These machines can be furnished with automatic grinding cycle. The chuck has a variable-speed belt drive using a hydraulic motor. The wheel-slide and table have power rapid traverse.

Fig. 3. Hydraulic Shaft-duplicating Lathe to be Exhibited by the American Tool Works Co.



## Oilgear Vertical Broaching Machines

Booth 440

The Oilgear Co., 1312 W. Bruce St., Milwaukee 4, Wis., will feature its line of vertical Cyclematic broaching machines which was discontinued during the war. These machines are suitable for single or multiple broaching of internal holes, splines, and special forms in automotive parts on a high-production basis. Positioning, threading, broaching, and ejecting of work is entirely automatic.

Other design features include a dual safety push-button control with selector switch for manual, semi-automatic and full-automatic operation; an automatic tool-handling mechanism, inserting mechanism and work-ejecting mechanism; automatic pressure lubrication of tool and work during the broaching operation; automatic pressure lubrication of the hardened and ground ways and slide; and variable broaching speeds up to 30 feet per minute, with independently variable return speeds up to 80 feet per minute. Three sizes of the Type XM machines are available—30- by

54-inch stroke, 50- by 66-inch stroke, and 75- by 66-inch stroke.

Another broaching machine, the Type XD double-slide vertical surface broacher, is similar in construction to the previous line of double-slide machines, but has a new type of mechanism for operating the shuttle tables. Two opposing interlocked hydraulic cylinders actuate two vertical cranks, which are linked with racks and pinions in the machine bracket. Both shuttle tables operate against positive stops on the broach frame, so as to preload the tables prior to broaching. Standard machines are available with either a 5- or an 8-inch depth of stroke.

Included in the Oilgear exhibit is a new feed pump and electrical control for application to machine tools. The Type JK pump is only 12 3/4 inches long, 11 inches wide, and 15 1/2 inches high. It is a self-contained, fully enclosed unit, and can be mounted integral with the machine or on a separate reservoir, remote from the operator's station. A variable-delivery radial piston feeding unit, a rapid-

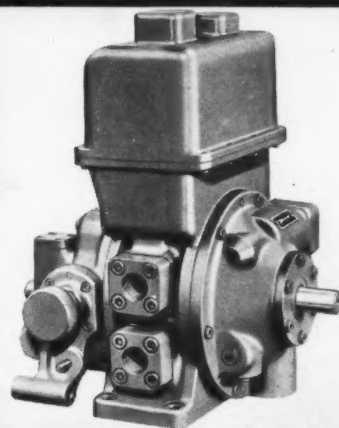


Fig. 2. New Oilgear Type JK Feed Pump

traverse gear pump, solenoid-operated control valves, and relief valves are built into the new units. The maximum feed delivery at 1750 R.P.M. is 240 cubic inches per minute, and the rapid-traverse delivery, 3200 cubic inches per minute.

## Bryant Grinding Machine

Booth 525

Among the grinders to be demonstrated by the Bryant Chucking Grinder Co., Springfield, Vt., are two high-production, high-precision machines, one for finishing small bores and the other for the internal grinding of large work.

The No. 109 automatic precision internal grinder, having a capacity for grinding bores from 1/4 inch to 3 inches in diameter and up to 4 inches deep, is equipped with electronic cycle controls and is capable of operating at speeds up to 100,000 R.P.M. Also incorporated in the design is a wheel-turning diamond that automatically compensates for wheel wear; sealed, preloaded ball-bearing slides; and electrical timing devices that provide a pre-set sparking out period. An infinite number of feeds and speeds for the cross-feed and work-drive spindle is available.

The No. 150 grinder is the largest machine made by the company. It has a 60-inch faceplate, a work-head that swings for angular work, and centralized hydraulic controls.

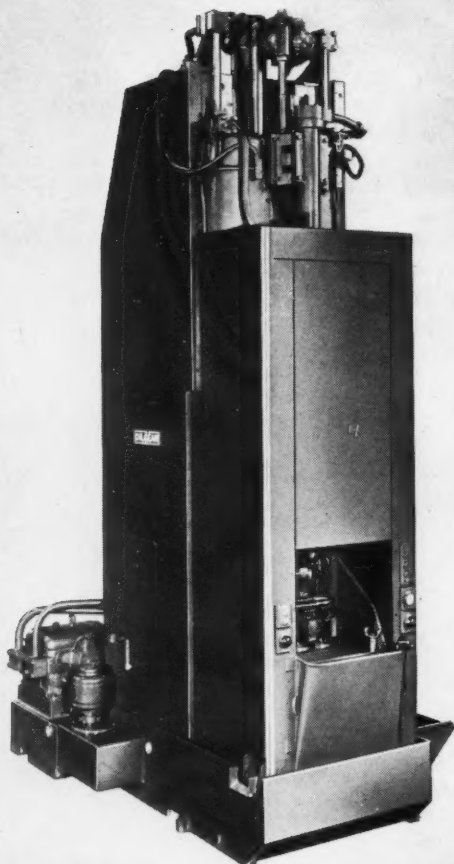


Fig. 1. 30- by 54-inch Vertical Cyclematic Broaching Machine Built by the Oilgear Co.





*Men Responsible for Results  
in the Machine Tool Using Industries*



E. L. Wilkinson, Production Manager, Lycoming Div., Avco Mfg. Corporation, Williamsport, Pa.



Geo. F. Thomas, Plant Manager, Stewart-Warner Corporation, Chicago, Ill.



J. E. Goodwin, Chief Mechanical Officer, Chicago & North Western Railway System, Chicago, Ill.



A. Fred Anderson, Factory Manager, Thompson Products, Inc., Bell, Calif.



R. D. Campbell, Tool Design, Manufacture and Coordination, Automatic Electric Co., Chicago, Ill.



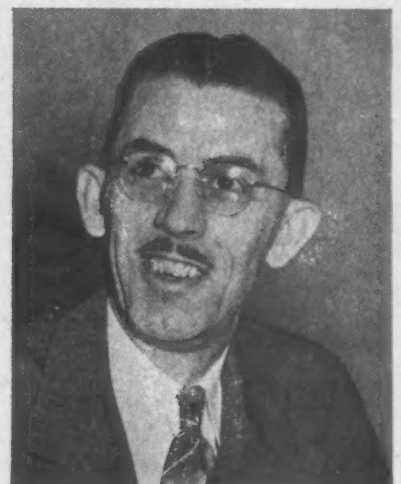
J. F. Woodman, Mechanical Superintendent, West Lynn Works, General Electric Co.



H. Menck, Vice-President and Works Manager, Harnischfeger Corporation, Milwaukee, Wis.



C. L. Barrett, Works Manager, Pomona Works, Fairbanks, Morse & Co., Pomona, Calif.



S. G. Hawley, Manager of Manufacturing, Willys-Overland Motors, Inc., Toledo, Ohio

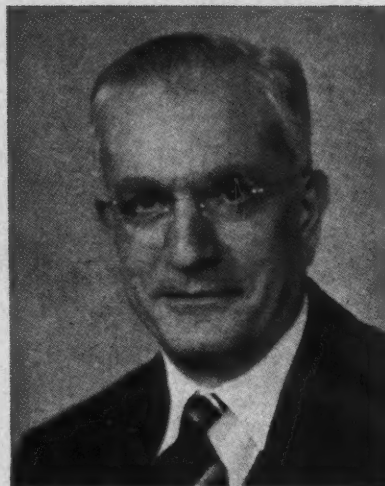
*Men Responsible for Results  
in the Machine Tool Using Industries*



Ray Evans, Production Manager,  
Lima Locomotive Works, Inc.,  
Lima, Ohio



Arthur G. Hall, Works Manager  
of the Nordberg Mfg. Co.,  
Milwaukee, Wis.



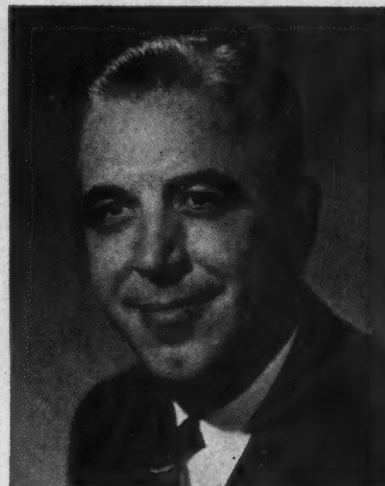
Albert William Beesch, Works  
Manager, The J. H. Day Co.,  
Cincinnati, Ohio



R. J. Schneider, Factory Man-  
ager, Propeller Div., Curtiss-  
Wright Corp., Caldwell, N. J.



L. A. Ringman, Works Manager,  
The National Supply Company,  
Toledo, Ohio



L. J. Ely, Factory Manager of  
the Caterpillar Tractor Co.,  
Peoria, Ill.



Jos. T. Branit, Factory Manager,  
Borg & Beck Div., Borg-Warner  
Corporation, Chicago, Ill.



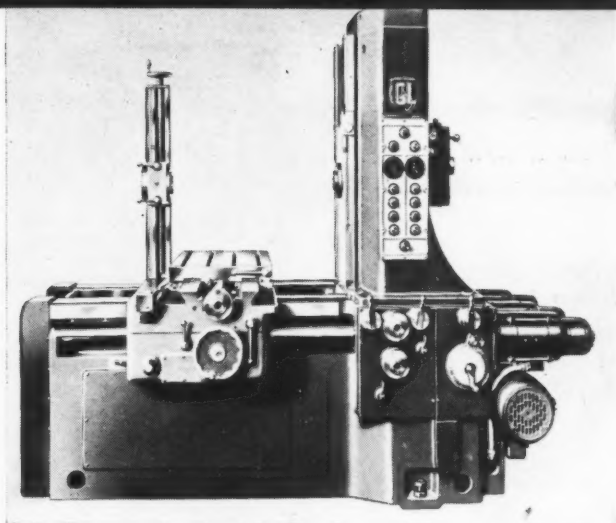
E. T. Gruendike, General Super-  
intendent, General Railway Sig-  
nal Co., Rochester, N. Y.



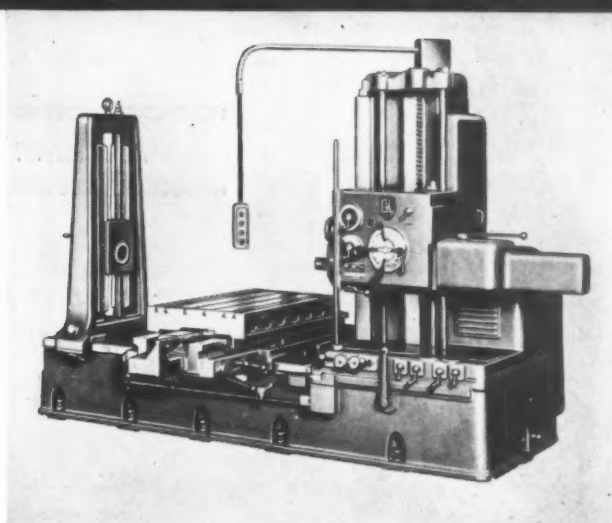
C. A. Franzen, Works Manager  
of the Electric Boat Co., Gro-  
ton, Conn.







**Fig. 1. Giddings & Lewis Table Type Horizontal Boring, Drilling, and Milling Machine**



**Fig. 2. Giddings & Lewis Medium-size Horizontal Boring, Drilling, and Milling Machine**

## ***New Machines Developed by Giddings & Lewis***

**Booth 315**

A horizontal boring, drilling, and milling machine (Fig. 1) designed with a view to obtaining a high degree of accuracy, together with versatility, will be displayed by the Giddings & Lewis Machine Tool Co., 140 Doty St., Fond du Lac, Wis. This Model 00-T machine will accommodate work up to 18 inches in height, width, and depth, and 1000 pounds in weight. With a tracing attachment, it can be used effectively for die-sinking work. It can also be employed for precision thread-cutting when equipped with a thread lead device. Driving gears on the spindle provide a substantial flywheel effect. All machine movements are regulated by electronic and mechanical controls in a centralized panel. The usual reciprocating boring spindle has been eliminated.

The medium-size, Model 300-T, horizontal boring, drilling, and milling machine (Fig. 2) produces excellent finish at high speed on average work up to 30 inches in size (all dimensions) and 8000 pounds in weight. Built-in scales and verniers give readings to 0.001 inch for the headstock, table,

and saddle movements. The machine can also be equipped with a simple micrometer measuring arrangement reading to 0.0001 inch.

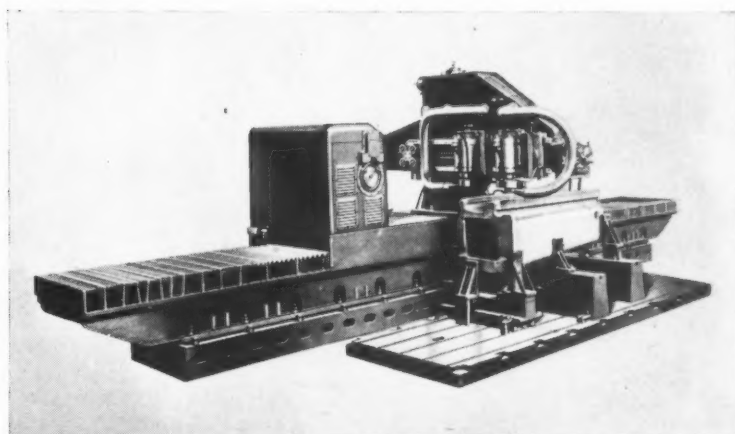
A precision way grinder (Fig. 3) is being exhibited for the first time. This grinder develops surfaces of a flatness varying by only a few ten-thousandths of an inch over a length of 20 feet or more. It speeds production of ways, gibs, and other parts formerly requiring hand-scraping. Precision grinding can be done at any angle.

The Model 570 floor, table, and planer type horizontal boring, drilling, and milling machines have been improved to accommodate heavy work and unwieldy, hard-to-reach parts. In the floor type machines, a compound angle base can be used to give the column two movements at right an-

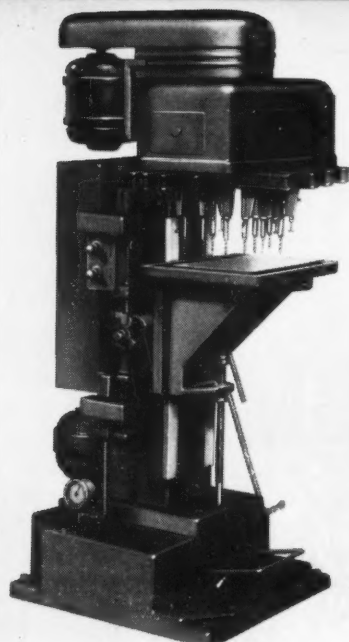
gles to each other. The table type machines provide even greater flexibility on work within their range. The planer type machines combine the work-holding capacity of a floor type machine with the flexibility and accuracy of a table type machine. The new table type 351-T horizontal boring, drilling, and milling machine, to be shown, has enlarged work-handling capacity, greater rigidity, and substantially increased power.

Also to be displayed are a Model 230 portable machine for precision boring, drilling, tapping, milling, and facing from unusual locations; a Model 340-MH multiple-head machine that permits simultaneous operations on three sides of a piece; improved accessories and attachments for extending the range of horizontal boring, drilling, and milling machines; power-driven rotary tables for floor type machines; and "Super" micrometer stub boring sets.

**Fig. 3. Machine for Grinding Ways, Gibs, and Other Parts, Built by Giddings & Lewis Machine Tool Co.**

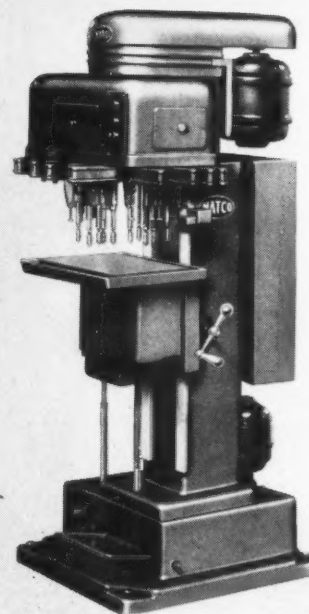


## MACHINE TOOL SHOW



**Fig. 1. (Left) Natco Multiple-spindle Drilling and Tapping Machine with a Combination of Feeds**

**Fig. 2. (Right) Ten Spindles can be Mounted on This Air-fed Drilling and Tapping Machine**



### Natco Multiple Drilling and Tapping Machines

#### Booth 4

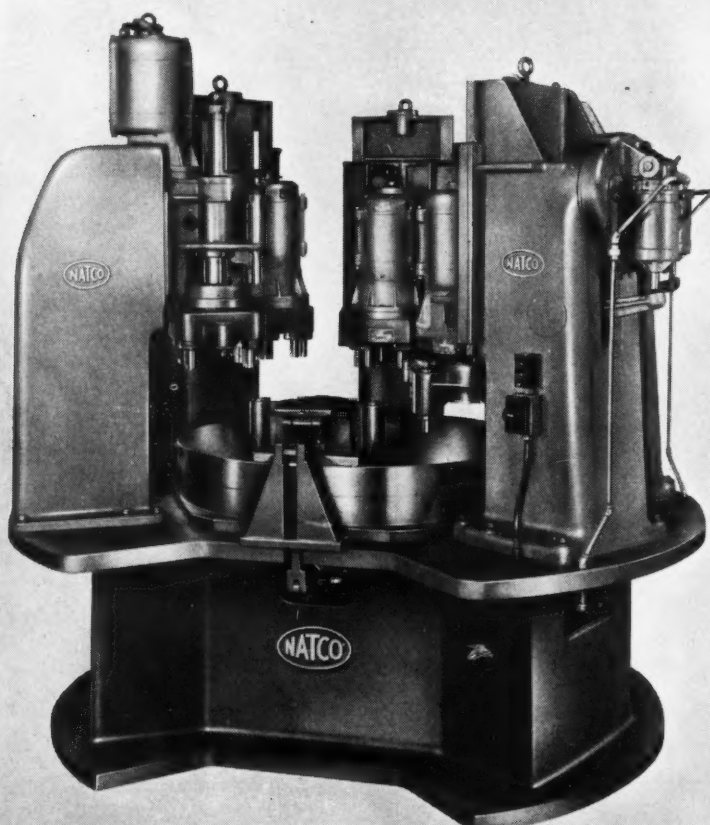
The National Automatic Tool Co., Inc., Richmond, Ind., will display a new line of small multiple drilling and tapping machines. These machines are made in two models—the Model A-33A shown in Fig. 1 and the A-33B shown in Fig. 2. They are of simplified design and will facilitate the production of small holes in light work where sensitivity and high speed are important. The Model A-33A

provides hand and foot feed or combination hand and foot and air-oil feed, while the Model A-33B provides air feed. The spindle arrangement can be changed and reset to suit each particular job. Spindle speeds are easily changed by rearranging pulleys on the sheave at the top of the machine.

The hand- and foot-feed machines permit close control for

sensitive operation, and are equipped for both drilling and tapping. The head is bored for ten spindles, with ten spindle speeds available from 650 to 3550 R.P.M. The air-feed machine is equipped with treadle-controlled air-feed table, and the hand-crank provides the vertical table adjustment. This machine is especially suitable for light precision tapping. The table has a maximum travel of 2 1/2 inches, compared with 4 inches on the A-33A combination machine.

Natco A-65 cam feed units are readily made up into special station type machines for the mass production of small parts, as can be noted from Fig. 3, which shows a complete automatic machine. This machine was developed to produce cylinder bodies for an automotive hydraulic brake part.



**Fig. 3. Completely Automatic Machine Made up from Cam Feed Units Built by the National Automatic Tool Co.**

It provides a six-position air index table with spring clamping fixture for the production of cover and compensating holes in the cylinder body. Two parts are handled at one time, seven holes being drilled and four holes tapped in each part. One of the most interesting features of this machine is the single master head which covers positions 4, 5, and 6. The

machine produces more than 400 parts per hour, and completes the automatic cycle in eighteen seconds.

Also to be exhibited are A-20 types A and B "Borface" units, described in the Shop Equipment News section of May, 1947, MACHINERY; an electronic machine; and a deep-hole drilling machine.

## *Red Ring Diagonal Gear-Shaver and Rotor Shaving Machine*

Booth 607

A unique method of feeding the work has been utilized in a new diagonal gear-shaving machine to be displayed by the National Broach & Machine Co., 5600 St. Jean, Detroit 13, Mich. In this machine (Fig. 1), the work is fed at an angle to its axis. This diagonal traverse facilitates the shearing action at each cutting edge, making it practicable to remove more stock per cycle in less cutting time; the entire cycle is composed of just two passes through the cutter. Also, the full face of the cutter is effective during each cutting cycle, which re-

sults in materially increasing the cutter life.

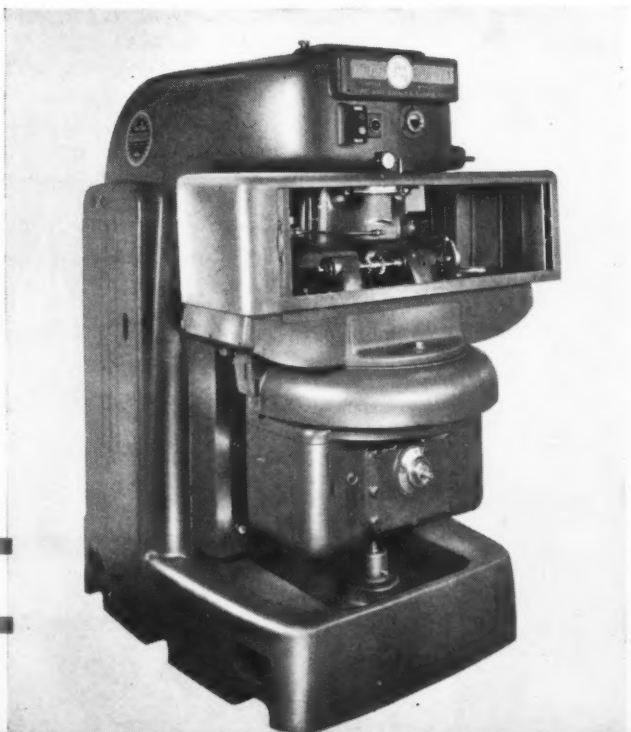
With diagonal traverse, there is no restriction on the face width of the cutter; thus the high cost of extremely wide-faced cutters is avoided. By this process, cutter face width may be considerably less than the face width of the work-gear, and no special cutters are required. Other advantages of diagonal feed are better control of lead on helical gears, less danger of cutter breakage when processing shoulder gears and less trouble with tapered tooth conditions on such gears.

Owing to its greater production capacity, the new machine is considerably heavier and more rigid than former shaving machines, and is more heavily powered.

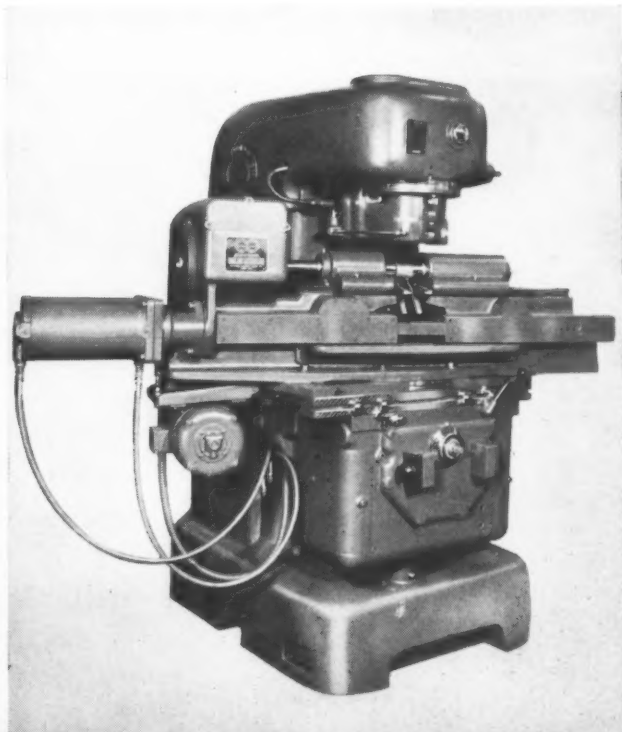
Another new machine to be shown is the "Rotoshaver," designed for machining the rotor of electric motors prior to winding. Three principles have been combined in this machine: These are (1) the use of a fine-pitch high-precision cylindrical milling cutter operating at high speed; (2) the principle of crossed-axes shaving, which has revolutionized gear shaving; and (3) the principle of traversing the work diagonally across the cutter in order to spread the cutter wear uniformly over its full face and obtain optimum tool life. The result is said to be accuracy comparable with grinding, a considerable reduction in machining time, and no closing of the laminations or burring of the slots.

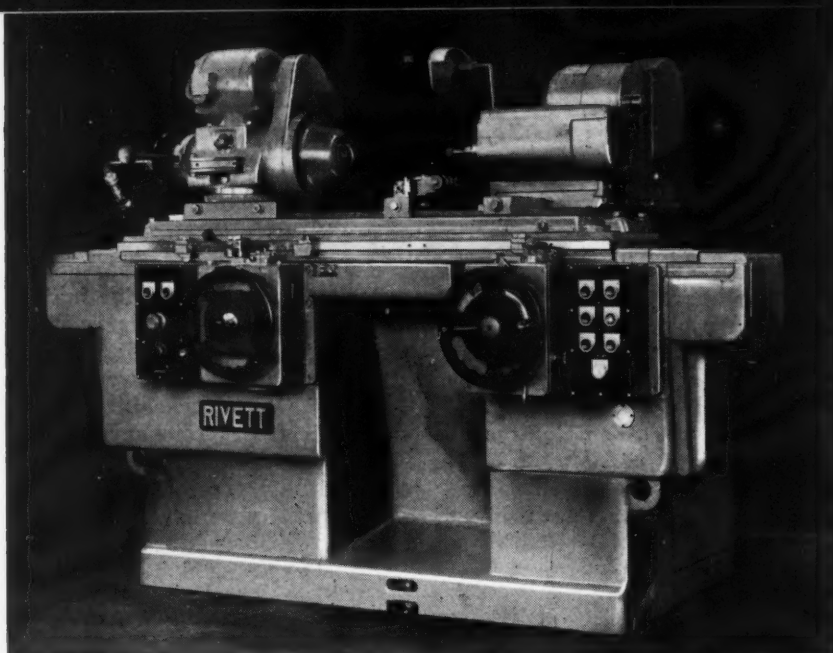
The "Rotoshaver" has a cutter-head that can be adjusted to provide a wide angular range between work and cutter axes. Its table has a 15-degree swing in the horizontal plane to provide the diagonal angle desired, and the knee can be adjusted vertically for different diameters of work.

**Fig. 1. Red Ring Diagonal Gear-Shaving Machine to be Exhibited by National Broach & Machine Co.**



**Fig. 2. New "Rotoshaver" with Wide Cutter-head Adjustment for Machining the Rotors of Electric Motors**





**Fig. 1. Rivett Hydraulic Grinder for Tool-room Work and Small-lot Production**

## *Rivett Tool-Room Grinding Machine and Lathes*

### **Booth 28**

A precision hydraulic grinder, Fig. 1, capable of handling all internal and external grinding encountered in the average tool-room, as well as small-lot production grinding, will be exhibited by Rivett Lathe & Grinder, Inc., Brighton 35, Boston, Mass. Two internal spindles for small and large holes and one external spindle can be interchanged on the cross-slide bracket of this 1024 grinder. The machine has a capacity for grinding holes from 1/4 inch to 9 inches in diameter and up to 6 inches in depth, and for grinding cylindrical work 10 inches in diameter and up to 18 inches in length. Straight, tapered, two-angle, face, and shoulder surfaces can be ground.

The work-head or table can be

accurately set at the desired angle by using a standard 5-inch sine-bar. The work-head spindle speed is determined by dial setting, an infinite range between 100 and 1000 R.P.M. being available. The work can be held in a collet, step or jaw chuck, on a faceplate, or between centers. The cross-feed has a separate adjustment to compensate for wheel wear without disturbing the finished-size stop.

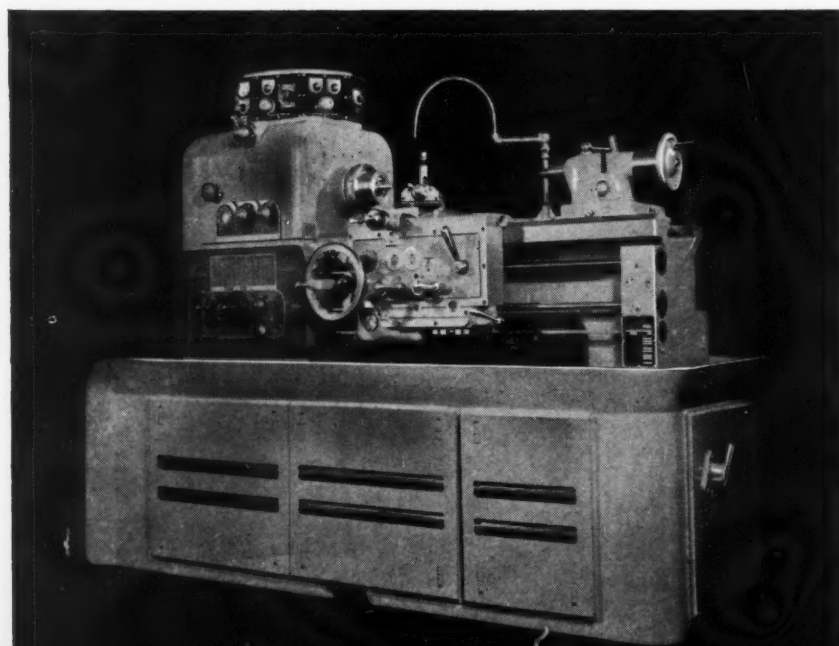
The Rivett 1020-R precision tool-room cabinet lathe (Fig. 2), also to be shown, is designed for turning work up to 10 inches in diameter by 20 inches long and threading to American and English standards by the manipulation of a dial only. Carbide tools can be used effectively.

The machine meets all specifica-

tions of a standard 10-inch engine lathe, and has seventy-two selective feeds or threads and infinitely adjustable spindle speeds from 24 to 2700 R.P.M. An electronic drive is directly coupled to a 2-H.P. motor, providing variable speed with dynamic braking. A hydraulic clutch reverses the carriage without stopping or reversing the lathe spindle.

The right spindle speed for efficient tooling, quick means for chucking the work, and grouped operating levers for reducing operator fatigue are features of the 918-S turret lathe shown in Fig. 3. The lathe produces small and medium-sized parts from bar stock or second-operation work. Draw-in collets up to 1 1/8 inches in diameter or step chucks up to 6 inches in diameter can be accommodated.

An automatic lever chuck-closer actuates the collets and step chucks, and can be used to control



**Fig. 2. Rivett Precision Tool-room Cabinet Lathe for Work 10 Inches in Diameter by 20 Inches Long**

**Fig. 3. Rivett Turret Lathe for Medium-sized Parts and Second-operation Work**

the spindle drive and brake. A chasing bar can be added to the lathe for the production of internal or external threads. Spindle speeds from 150 to 2500 or from 225 to 3750 R.P.M. are available.

The Rivett 918-S precision cabinet lathe, primarily used for turning operations without power feed, is similar in appearance to the 918-S turret lathe, except that a conventional tailstock and cross-slide are employed. The lathe has a swing of 9 inches; holds work in draw-in collets up to 1 1/8 inches in diameter and in step or jaw chucks up to 6 inches in diameter; and has a distance between centers of 18 inches.

The new 1R watchmaker's lathe (Fig. 4), has a totally enclosed headstock which eliminates vibration and affords a convenient hand-rest. An outboard spindle pulley permits the use of an endless woven belt. An index-ring, graduated in sixty divisions, insures accurate indexing of work.

The lathe bed, spindle pulley, index-ring, and all operating handles and knobs of this lathe are made of corrosion-resistant materials. The length of bed is 12 inches; swing over headstock, 3.94 inches; and distance between centers, 5 inches. The lathe accommodates 1R wire chucks, with a maximum through-hole capacity of No. 50 metric (0.1969 inch) and a maximum stepped-hole capacity of No. 65 metric (0.2559 inch).

**Fig. 4. Improved Watchmaker's Lathe Made by Rivett Lathe & Grinder, Inc.**



## Avey-Draulic Feed Unit

Booth 467

A hydraulically fed, mechanically and electrically controlled drilling spindle that incorporates rapid advance, feed, and return, and automatic withdrawal of the drill for clearance of chips will be displayed by the Avey Drilling Machine Co., Cincinnati, Ohio. This feed unit, known as the "Avey-Draulic," is provided with a "Torque-Matic" control.

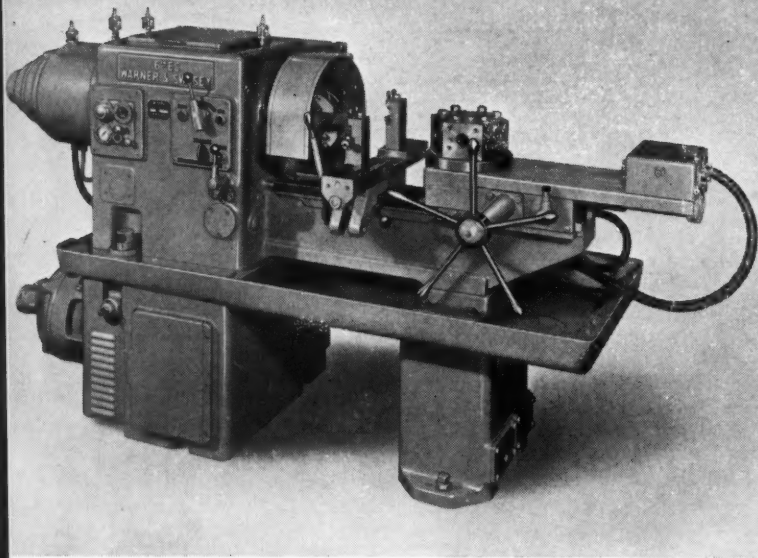
Torsion applied to the spindle drive sleeve through cams from a driven pulley is directly controlled by the pre-set amount of spring pressure on the cam plate. When the torque is increased, the drill

is automatically withdrawn from the hole by a switch-operated solenoid.

Six sizes of these units are available, having a maximum stroke of from 8 to 20 inches. The two smaller sizes have a hole drilling capacity of 5/16 inch in SAE 3140 steel, and a speed range of from 740 to 3000 R.P.M. The four larger sizes have a 9/16-inch diameter drilling capacity in SAE 3140 steel and a speed range of 500 to 2500 R.P.M. Hydraulic power of 6 gallons per minute at 430 pounds per square inch is required for a single head.



## LATEST PRODUCTION EQUIPMENT



**Fig. 1. (Left) Electro-Cycle Turret Lathe Developed by Warner & Swasey for Machining Non-ferrous Materials**

**Fig. 2. (Below, Center Column) Warner & Swasey Precision Tapping and Threading Machine**

**Fig. 3. (Below, Right-hand Column) Warner & Swasey Scroll Chuck Made in Sizes from 8 to 24 Inches**

### *New Warner & Swasey Developments*

Booth 309

A new Electro-Cycle turret lathe (Fig. 1), developed especially for machining non-ferrous metals, is an important exhibit of the Warner & Swasey Co., Cleveland 3, Ohio. This machine was designed with a view to reducing machine-handling time and operator fatigue and thus increasing production.

A drum control mounted on the turret-slide accomplishes all starting, stopping, and speed changes, and automatically reverses the work-spindle as required. An automatic device stops the spindle at the same loading position each time. The spindle brake is electrically controlled, and the brake limit switch operating cam is adjustable through 360 degrees. No gears, clutches, or sliding parts are used in the headstock. Instant spindle speed changes in the ratio of 2 to 1 are provided by a two-speed motor and V-belt drive. A stationary air cylinder is used for chucking the work. The lathe has a capacity for 1 1/2-inch diameter bars and a swing of 16 7/8 inches.

Another machine to be shown—the No. 11 precision tapping and threading machine (Fig. 2)—has been redesigned to increase accessibility of controls and provide greater safety and ease of operation. A safety clutch stops the tap if it strikes chips in a blind hole. Automatic reversal provides for backing the tool out at a predetermined depth. Solenoid-operated guide fingers engage a master

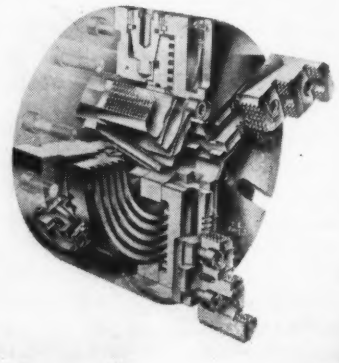
lead-screw and reproduce in the work-piece the accuracy of thread ground into the tap or die used.

An entirely new single-spindle automatic chucking machine is designed to obtain rigidity, ease of set-up, and cross-slide selectivity. This No. 1-AC machine has four automatic speed changes and three automatic feed changes, the range of which can be changed by pick-off gears. Front and rear cross-slides operate independently of the turret and of each other, and either or both of the slides can be operated on any turret face or while the turret is dwelling. Other features of design include accessibility and adequate chip disposal and coolant facilities.

A line of scroll chucks (Fig. 3), available in sizes from 8 to 24 inches, will also be displayed. Each of the heavy-duty chucks is adaptable to any machine having an American Standard flange type

spindle nose. Alloy-steel scrolls operate on large bronze bearings mounted on the chuck body.

The two No. 5 universal turret lathes to be shown are equipped with new hydraulic bar feed and collet chucks. A small ball-han-



dled lever controls both bar-feed and collet-chuck mechanisms. Three No. 2 and three No. 3 ram type turret lathes, each size provided with identical tooling and a different type of drive, will be seen. One of each size standard lathe is equipped with a two-speed motor that makes available twelve spindle speeds. The second of each size is a four-speed Electro-Cycle machine. The third machines are electronic-drive Electro-Cycle lathes with infinite speed range.

A single-lever controlled rapid traverse for carriage cross-slide and saddle and a positive locating and clamping mechanism for the hexagonal turret have been incorporated in the newly designed 1-A and 2-A universal turret lathes, which will also be on exhibit.







*Men Responsible for Results  
in the Machine Tool Using Industries*



Ralph Ruud, Assistant Factory Manager, North American Aviation, Inc., Los Angeles, Calif.



Charles A. Blair, Assistant Plant Superintendent, Tooling, Twin Coach Co., Kent, Ohio



Dunstan S. Gross, Factory Manager, Friden Calculating Machine Co., Inc., San Leandro, Calif.



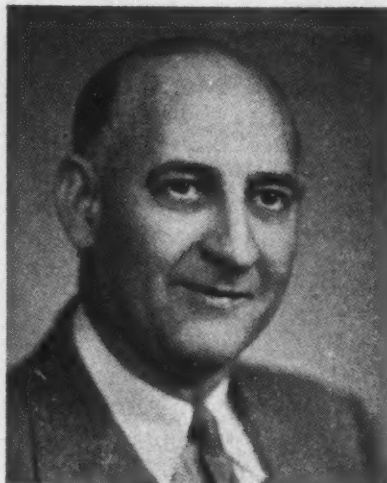
Colonel C. A. Waldmann, Commanding Officer, Ordnance Dept., Rock Island Arsenal, Rock Island, Ill.



Harry E. McLean, Supt., Production, Chevrolet-Saginaw Service Manufacturing, Saginaw, Mich.



H. M. Emlein, Manager, RCA Victor Div., Indianapolis Plant, Radio Corporation of America



Harry E. Herbert, Plant Superintendent of Appleton Electric Co., Chicago, Ill.



Lynn A. Williams, Jr., Vice-President, South Wind Div., Stewart-Warner Corp., Indianapolis, Ind.



Merle F. Payne, Factory Superintendent of Fuller Mfg. Co., Kalamazoo, Mich.

*Men Responsible for Results  
in the Machine Tool Using Industries*



P. J. Rees, General Superintendent of the S. Morgan Smith Co., York, Pa.



J. G. Wray, Jr., Manager, Machinery Div., The Crown Cork & Seal Co., Baltimore, Md.



F. E. Banfield, Jr., Vice-President and Works Manager, Whitin Machine Works, Whitinsville, Mass.



Otto Dreher, General Superintendent, Geo. J. Meyer Mfg. Co., Milwaukee, Wis.



F. L. Cimperman, Jr., Supt., Tool and Model Shop, National Advisory Com., Aeronautics, Cleveland



A. A. Grossarth, Production Engineer, Miehle Printing Press & Mfg. Co., Chicago, Ill.



W. A. Newman, Superintendent of Shops, Chicago, Burlington and Quincy R.R. Co., Burlington, Iowa



J. M. Lucarelle, General Superintendent, Dictaphone Corporation, Bridgeport, Conn.



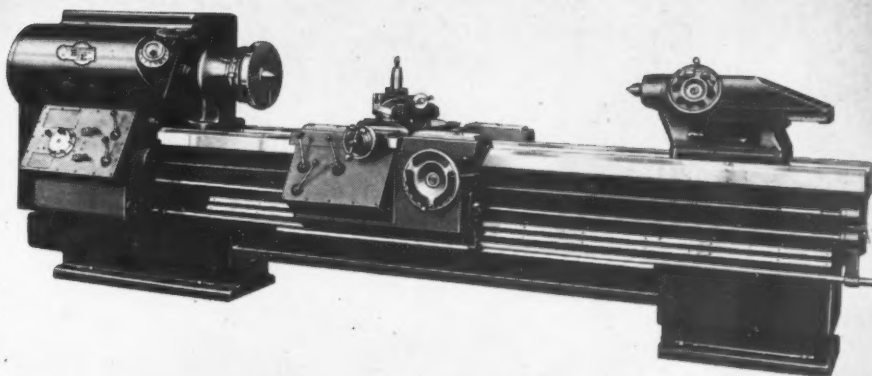
Earl J. Ruggles, Production Engineer, Gemmer Mfg. Co., Detroit, Mich.





BE SEEN AT SHOW

*Boye & Emmes 25-inch Lathe Designed to Provide Convenience of Operation and Sufficient Power for Carbide Tooling*



### *Boye & Emmes New Lathe*

**Booth 611**

Better placement, visibility, and means of manipulating all controls are features of the new 25-inch "Golden Anniversary" lathe which will be introduced at the Show by the Boye & Emmes Machine Tool Co., 125 Caldwell Drive, Cincinnati 15, Ohio. This machine has been designed to take full advantage of carbide tooling. All gearing in the sixteen-speed headstock is heat-treated and shaved. The low-speed shaft is located at the front to offset the lifting tendency of the tool under heavy cuts. All speeds are obtained by the operation of a dial.

The gear-box is provided with sixty-four feed and thread changes, also obtained through dials. Feed directional control, as well as lead-screw nut and power rapid-traverse engagement, is located on the apron panel. The tailstock slide is a departure from the conventional quill type, with an extra long bearing in the tailstock base. Provision for taking up wear and maintaining alignment is included. This slide is self-locking, and an adjusting handwheel located at the front travels with the slide. The tailstock is locked to the bed by a single lever.

Show. The improvements include heavier bed and table sections for greater serviceability and strength; larger and heavier rail- and side-heads; side-heads designed as independent units, each with its own individual motor drive and controls; and a balanced geared table drive with constant-feed table lubrication. The column and cross-rails have also been designed with deeper and stiffer sections.

Power rapid traverse and feed in all directions on both rail- and side-heads are provided. A motorized automatic rail clamp and automatic rail re-leveling mechanism are incorporated in the design. The push-button pendant control and the selector levers, which are duplicated at both ends of the rail and on each rail-head, give the operator full control at all times. The new planer is equipped with safety devices, including interlocked clutches, special electrical controls, friction devices, and limit switches.

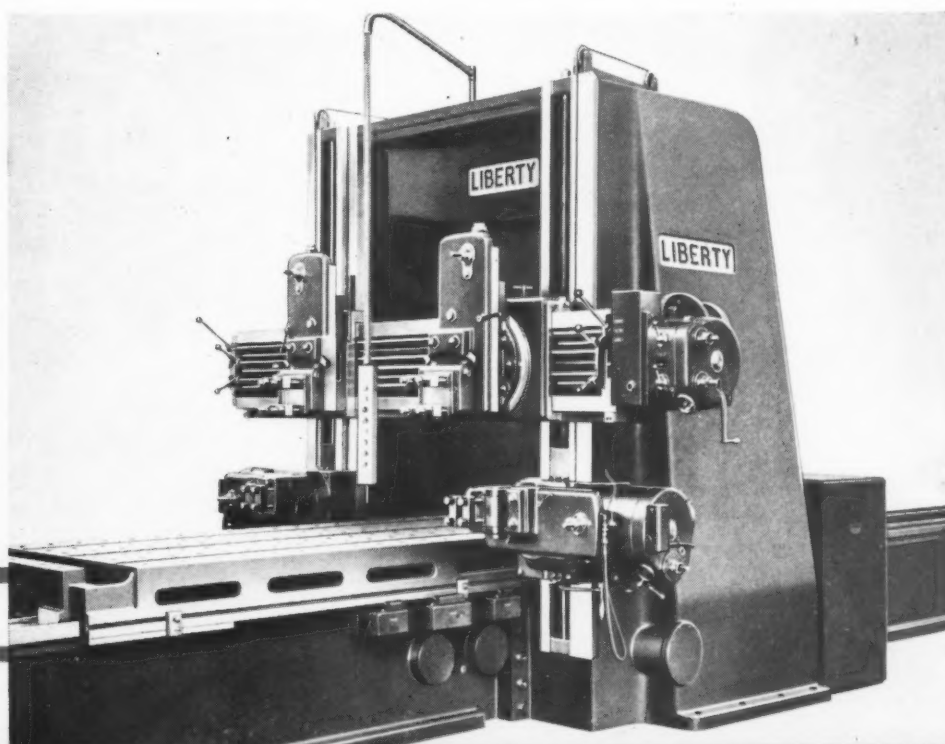
### *Liberty Double-Housing Planer*

**Booth 415**

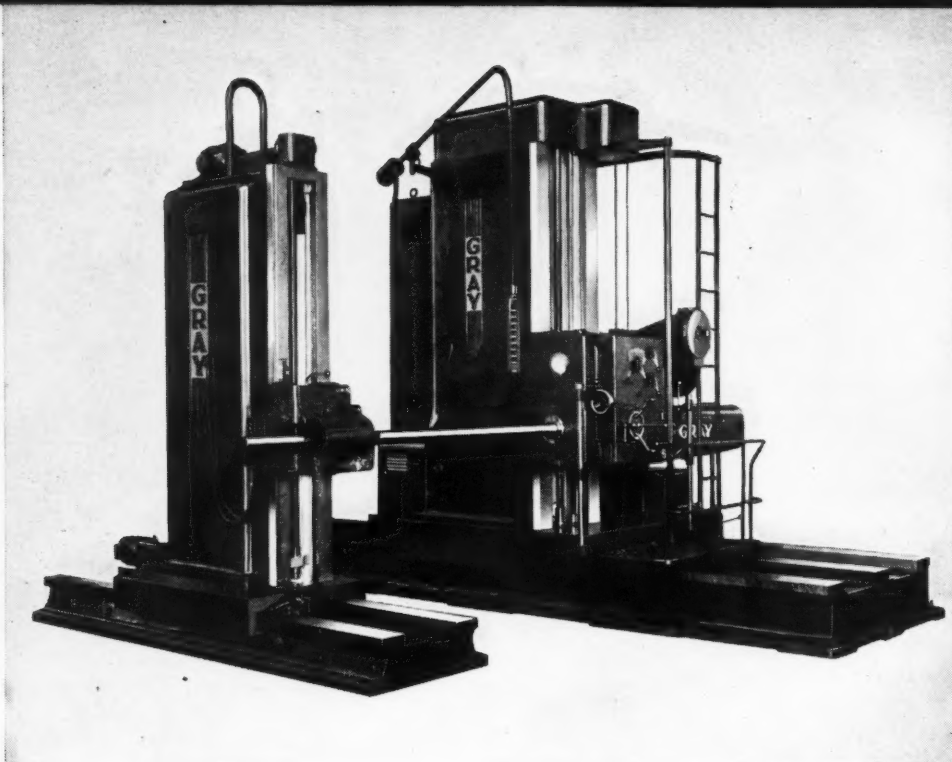
Several improvements have been made by Liberty Planers, Inc., 1000 Weller Ave., Hamilton, Ohio,

in its large 60- by 60-inch by 20-foot double-housing heavy-duty planer to be exhibited at the

*Liberty 60- by 60-inch by 20-foot Double-housing Heavy-duty Planer of Improved Design*



TO BE SEEN



**Fig. 1. (Left) Gray Floor Type Horizontal Boring, Drilling, and Milling Machine**

**Fig. 2. (Below) 30-inch by 8-foot Open-side Planer Cub Made by the G. A. Gray Co.**

## ***New Boring, Drilling, and Milling Machine and Planer to be Exhibited by G. A. Gray Co.***

**Booth 501**

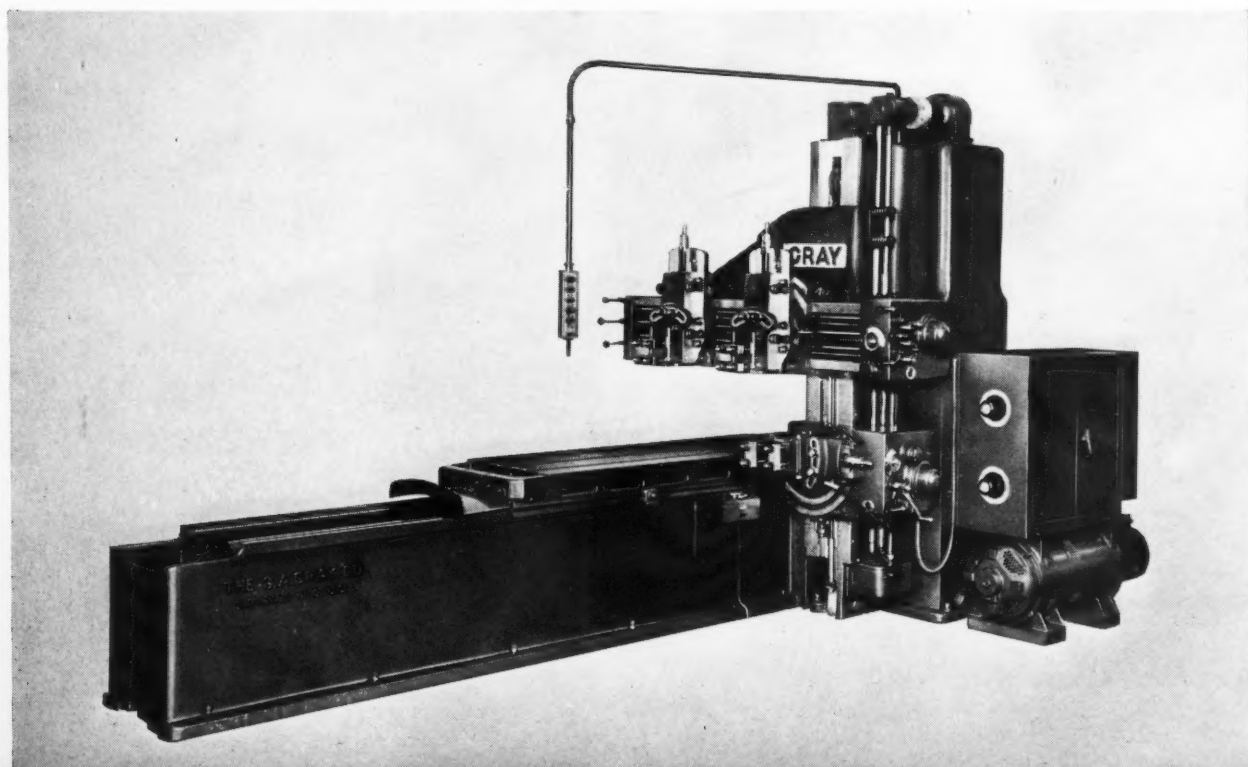
The G. A. Gray Co., 3611 Woodburn Ave., Cincinnati 7, Ohio, will exhibit the new 6-inch floor type horizontal boring, drilling, and milling machine shown in Fig. 1. It has a 60-inch continuous bar travel, a 72-inch vertical head travel on the column, a 96-inch column travel on runway, and 24-inch column cross travel. This new machine has many advanced features, such as electronic drives for all feeds, non-metallic ways

for the column base and saddle, and automatic power clamping of the column base, saddle, and headstock.

Its most conspicuous feature, however, is the simplicity of the control. The controls of the head, column, and spindle are centralized in a pendent switch. Two three-position selectors on the switch are used to indicate the direction of feed or rapid traverse of the head or column. Push-but-

tons and a potentiometer are used to obtain feed, rapid traverse, and micro-positioning of the unit for which the selector is set.

The non-metallic ways provided on the column base and saddle surfaces that bear against the ways minimize wear and scoring of the way surfaces. A "Woodpecker" positioning device makes it possible to set the various units within 0.00025 inch by simply pressing a micro-jog button on the pendent switch. An "Insto-Speed" change unit provides twenty-four speeds in geometric progression for the single heavy-duty spindle, which is driven by a 40-H.P. motor. The normal

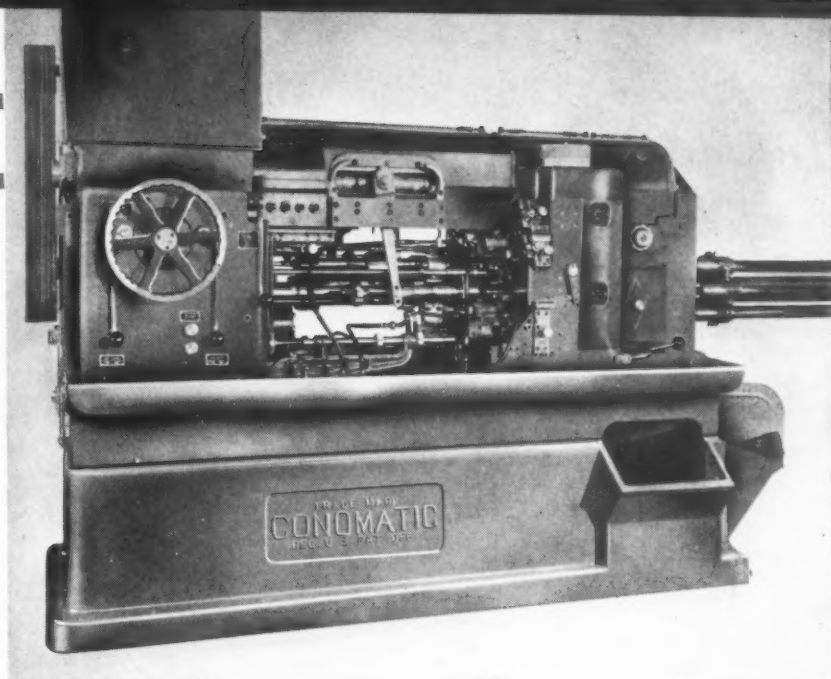


## AT THE SHOW

### *Conomatic Six-spindle, 1-inch Capacity Bar Machine*

speed range is from 4 1/2 to 900 R.P.M., but lower speed ranges can be furnished.

Also on exhibit will be a new design 30-inch by 8-foot open-side planer Cub (Fig. 2) and a 42-inch by 42-inch by 10-foot double-housing planer. These two planers will be equipped with carbide tools for operation at speeds up to 300 feet per minute.



### *Conomatic Multiple-Spindle Bar Machines*

**Booth 617**

A new 1-inch capacity, six-spindle Conomatic bar machine will be demonstrated by the Cone Automatic Machine Co., Inc., Windsor, Vt. Faster spindle speeds and many outstanding features are incorporated in this machine. It will be tooled to produce two mating parts in one machine cycle, utilizing twenty-five tools and six attachments.

Also to be displayed are a 5-inch four-spindle and a 2 5/8-inch six-spindle Conomatic demonstrating chip removal with carbide tools in the production of compound gear blanks and bearing races. Another exhibit will be a

new type of multiple-spindle 1 5/8-inch bar machine, called the "Multi-Single," for pieces requiring few machining operations.

### *Wiedemann Turret Punch Presses*

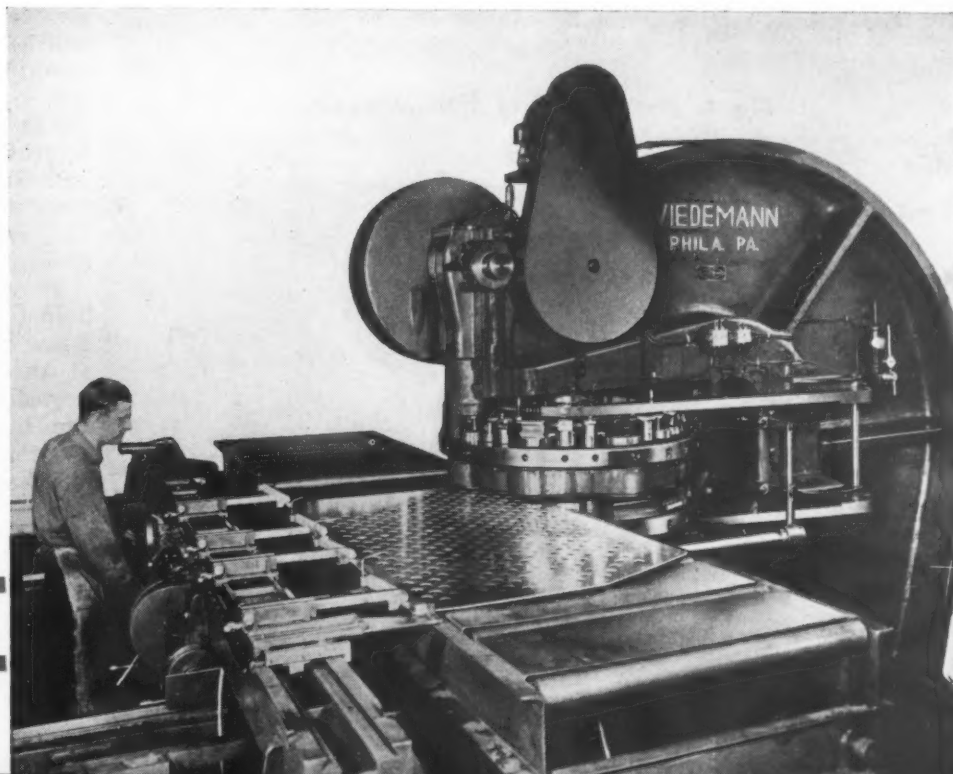
**Booth 32**

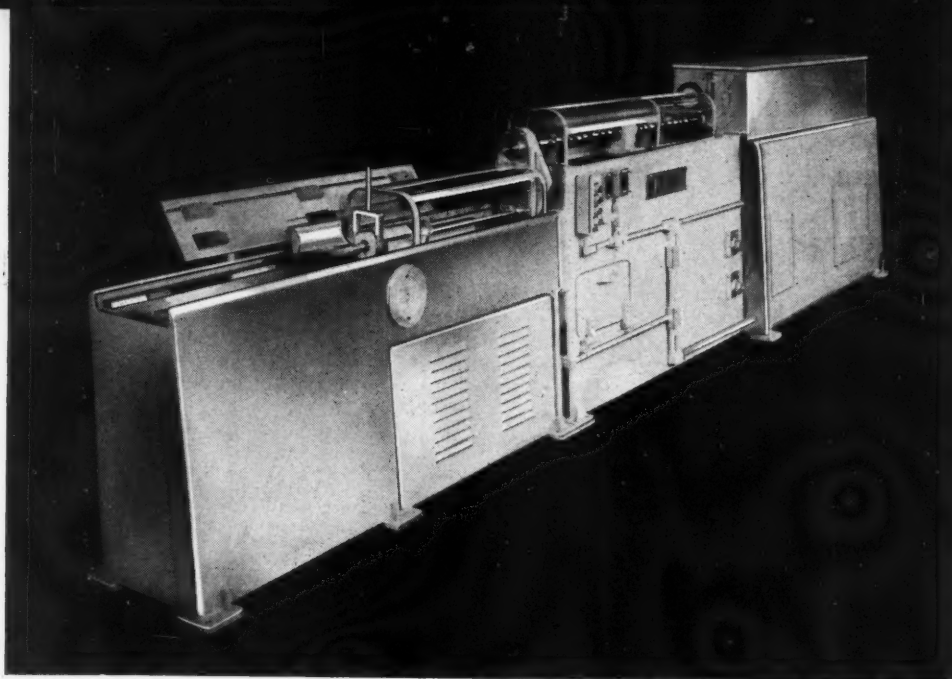
The latest turret punch presses made by the Wiedemann Machine Co., 4272 Wissahickon Ave., Philadelphia 32, Pa., will be shown in operation on short-run piercing jobs. The Type R-7 turret punch press illustrated incorporates a

gaging arrangement which handles large sheets and plates up to 60 by 120 inches by 1/4 inch thick, in one operation, without conventional lay-out. The gage table permits piercing different shaped holes up to 6 inches square. The work is positioned on the table by means of handwheels. Dimensions are easily set directly from blueprints. The turret is motor-operated, and the proper punch and die are quickly rotated into the punching position. This press exerts 160,000 pounds pressure, has a 54-inch throat, makes 65 strokes per minute, and contains from twelve to thirty-two punches and dies.

Also to be displayed is a turret punch press developed to pierce accurately through templets.

**Wiedemann Turret  
Punch Press for Sheets  
and Plates up to 60  
by 120 Inches by 1/4  
Inch Thick**





TO BE SEEN

*Lapointe Horizontal Pull Broaching Machine for Producing Spiral-cut Grooves in Rifle Barrels*

## *Lapointe Broaching Machines and Grinder*

Booth 642

Fast, precision cutting is the outstanding feature claimed for the 15-ton, 66-inch stroke single-ram vertical hydraulic broaching machine to be displayed by the Lapointe Machine Tool Co., Hudson, Mass. Three broaches, mounted adjacent to each other on the ram of this machine, are employed to cut seventy-eight diagonal, key-way-shaped slots around the circumference of a jet engine compressor wheel.

The 7 1/2-ton, 48-inch stroke horizontal pull broaching machine shown in the illustration is tooled to produce spiral-cut grooves in 0.22 caliber rifle barrels, completely broaching a barrel in one pass. By the use of a special lead bar and fixture, motive power is

supplied to rotate the barrel as the broach is being drawn through it. A special force-feed cutting fluid system and end cap have been adapted to a standard broach guide tray.

Also to be displayed are a 2 1/2-

ton, 30-inch stroke horizontal pull broaching machine; a 2 1/2-ton, 18-inch stroke vertical push broaching machine; a 5-ton, 54-inch stroke double-ram vertical broaching machine; a 20-ton 42-inch stroke vertical pull broaching machine; and a 60-inch capacity universal broach and tool grinder having 10-inch vertical and cross travels.

## *Cincinnati Press Brake, Shaper, and Shear*

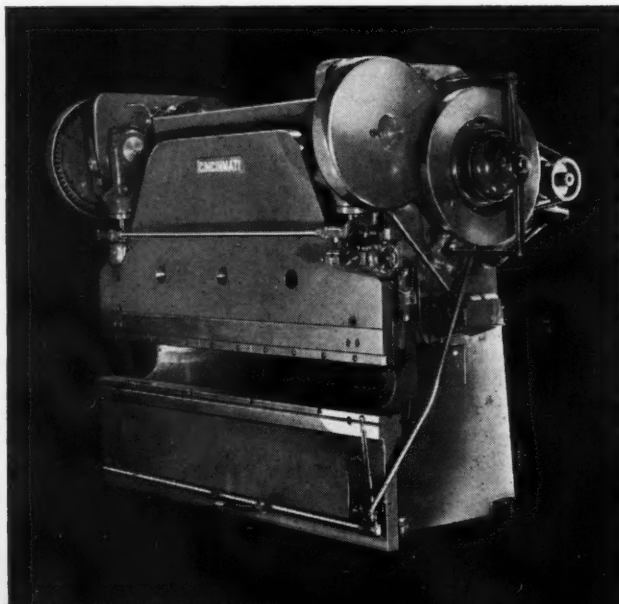
Booth 417

The press brakes to be displayed at the Show by the Cincinnati Shaper Co., Hopple, Garrard, and Elam, Cincinnati 25, Ohio, will include a 130 series, 3/8-inch capacity, and a 50 series, 10-gage capacity machine. Among the features of the 130 series brake

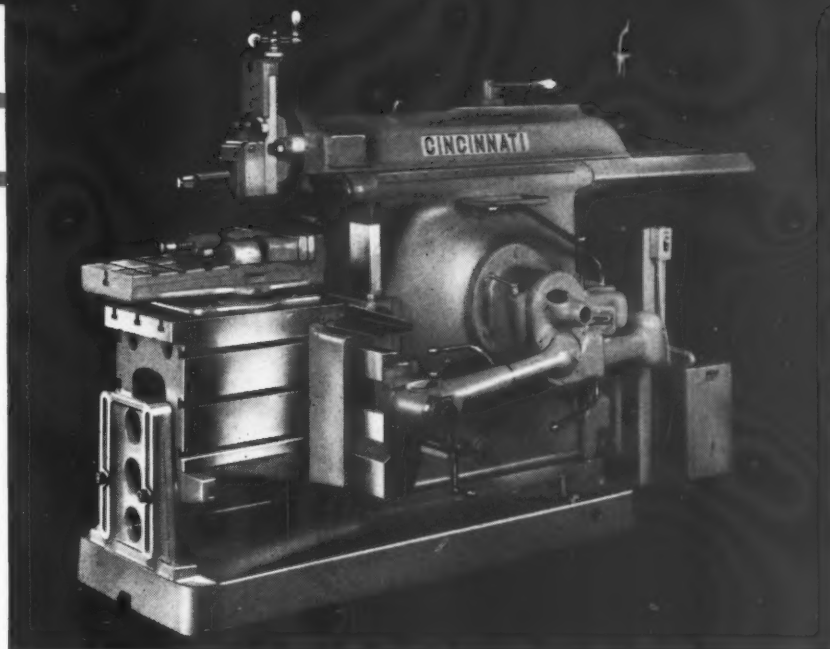
(Fig. 1) are a combination manual and air clutch control and two-speed transmission. This machine is also equipped with a tonnage indicator, a bed and ram extension which can be used for horn-ing operations, and auxiliary angles for press work. The brake will be seen performing a multi-operation job combining notching, crimping, rolling, and bending in progressive steps along the length of the machine. Gang punching bolsters, safety electric treadle lock, and automatic overload release are features of the 50 series brake.

The Cincinnati shaper line has been improved by the addition of a new oiling system and rail clamp at the operator's position. Improved dials, motor drive, guards, and bearings are also included. Several shapers equipped with different types of tables, heads,

**Fig. 1. Press Brake of 3/8-inch Capacity Made by the Cincinnati Shaper Co.**



**Fig. 2. Cincinnati 24-inch Heavy-duty Shaper of Improved Design to be Exhibited at the Machine Tool Show**



and other accessories will be exhibited. Demonstrations of heavy-duty and high-speed cutting and interesting operations will be seen. The 24-inch heavy-duty shaper illustrated in Fig. 2 will be on display.

An improved Cincinnati Series 1410 squaring shear (Fig. 3) will represent the third line of machines to be displayed. This 3/16-inch by 10-foot capacity shear is provided with a newly designed sheet sag eliminator and tilting stops. The sag eliminator is a magnetic sheet support especially adapted to production work on magnetic materials where extensive use of the back gage is required. High-strength permanent magnets, mounted in channels under the back brace, hold the sheet to be gaged flat and against the back-gage stop.

The shear will also be equipped with inclined ram, hydraulic hold-down clamps, squaring arm, im-

proved light beam gage, slitting gage, improved power-operated back gage, electric clutch control, and other accessories. The electric clutch control will permit the operator to work on the full-length treadle bar for close work or on foot switches away from the machine when trimming wide sheets or working on long sheets. When both the full-length treadle and foot switches are employed, the treadle actuates the solenoid through an operating switch.

### **Houghton "Cut-Max" Cutting Oils**

**Booth 47-D**

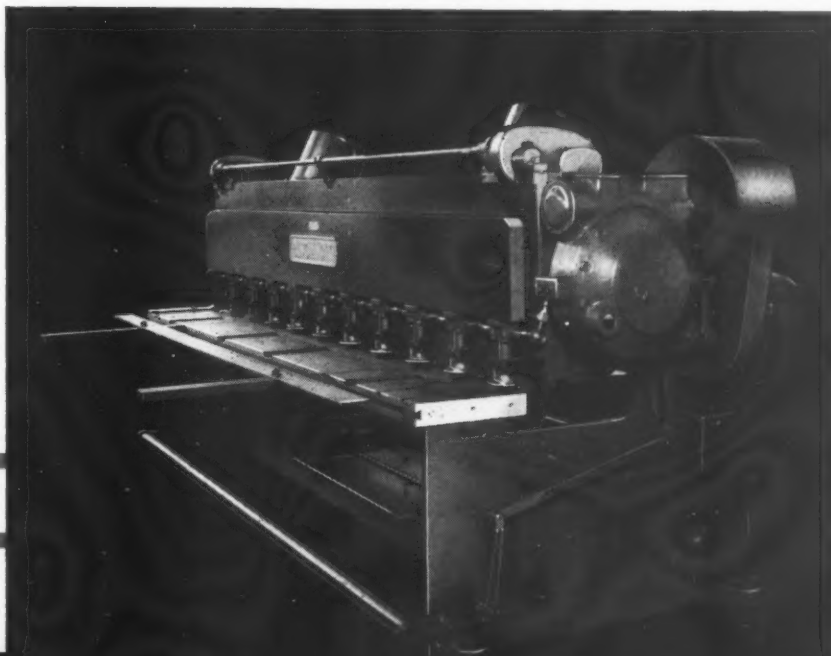
Four new series of "Cut-Max" straight cutting oils are being introduced at the Show by E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa. The

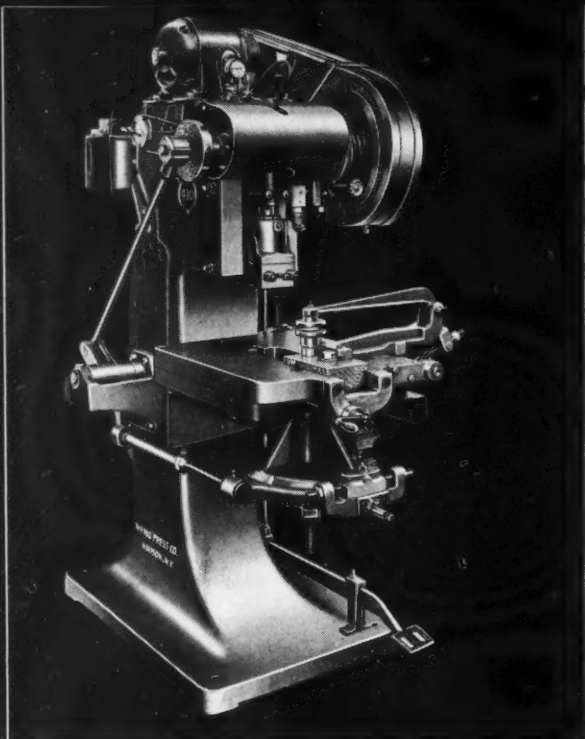
100 series includes cutting fluids (in a wide viscosity range) that have a high saponifiable-oil content but contain no extreme pressure additives. The 200 series, for heavy-duty machining, has a high sulphur and saponifiable-oil content, and is fortified with pressure additives. For use when even slight staining or dulling is objectionable, the 300 series, which is free from chlorine but contains a large amount of saponifiable oil and active sulphur, is recommended.

Finally, the 400 series is intended to meet the demand for low-cost high-quality cutting fluids for use on automatics and other high-production machines where feeds are light and speeds are high. These are light, clear oils.

Hydraulic oils treated for oxidation stability and anti-corrosion properties, other lubricants, and machine packings will also be displayed.

**Fig. 3. One of an Improved Line of Squaring Shears with New Gaging Equipment, to be Exhibited by the Cincinnati Shaper Co.**





(Left) High-speed Notching Press Made by the V & O Press Co.

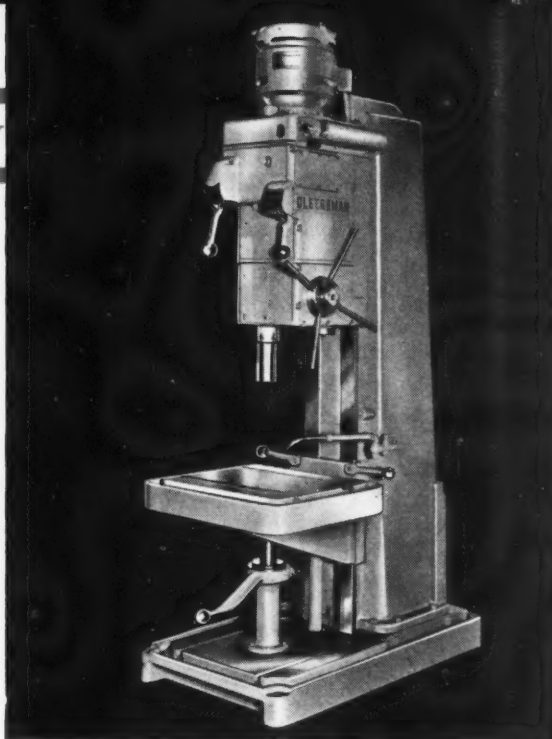


Fig. 1. (Right) New Upright Sliding-head Drilling Machine Built by the Cleereman Machine Tool Co.

## V & O High-Speed Notching Press

Booth 150

The high-speed notching press illustrated is to be shown by the V & O Press Co., Inc., Hudson, N. Y. This machine will operate at speeds up to 800 strokes per minute. It is especially equipped for notching electrical motor laminations. An expanding type disk-holder on the machine permits the notching of motor laminations with keyways. The clutch mechanism of this press has been redesigned to make it more efficient and more easily adjusted.

## Cleereman Upright Drilling Machine and Electronic-Control Jig Borer

Booth 123

An upright sliding-head drilling machine and an electronic-control jig borer will be exhibited at the Machine Tool Show by the Cleereman Machine Tool Co., 400 W. Madison St., Chicago 6, Ill.

The Model 325 single-unit drilling machine, shown in Fig. 1, is equipped with a single selector lever by which four quick-change feeds can be obtained. A range of six or twelve spindle speeds, depending on the electrical equipment, is available, and any thread

lead for tapping threads of 6 to 50 pitch can be provided.

The fully enclosed sliding head includes not only the spindle and feed mechanisms, but also the motor and spindle speed transmission. Both head and table are adjusted vertically by hydraulic power. Attachments available include automatic tapping reverse, flanged quills for multiple heads, special spindle tapers or slots for driving keys, compound tables, and a four-position depth stop that allows presetting to four depths of feed. Multiple units are made in combinations of two to six spindles or more.

In the new Cleereman jig borer, illustrated in Fig. 2, power drive has been added to the table by means of electronically controlled motors to provide pre-positioning control, power traverse, and a full range of milling feeds. Two individual motors drive the machine, one for each direction of table travel, with the speed controlled by a common electronic panel so that the proper rate of feed can be obtained for milling in all directions. In addition, a power rapid traverse rate of 50 inches per minute is available for indi-

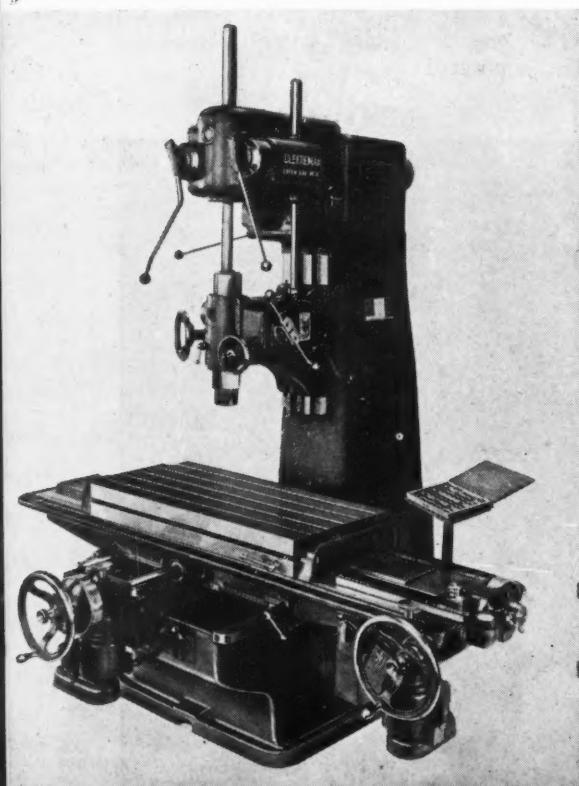


Fig. 2. Cleereman Jig Borer with Two Electronically Controlled Motors, One for Each Direction of Table Travel

cating and aligning work, for rapid advance to the cutting position, and for pre-positioning work before boring.

For pre-positioning work, a "creep" speed is actuated by limit switches built into the dial-indi-

cator housing. Contact of the table with a limit switch slows down the motor by dynamic braking to "creep" speed until measuring rods contact the dial indicator and the table stops in the correct position.

## ***Brown & Sharpe Automatic Screw Machines***

**Booth 505**

The exhibit of the Brown & Sharpe Mfg. Co., Providence, R. I., will include the Nos. 00G and 0G high-speed automatic screw and automatic cutting-off machines here shown, which have been redesigned with a view to increasing production and efficiency, and a larger automatic—the No. 2G—with 1- or 1 1/2-inch capacity spindle.

The spindle of these machines is positively driven at all speeds by multiple-width roller chains. The chains have predetermined tension adjustment, and remain unchanged for all combinations of speed and direction of spindle rotation.

Spindle speeds in 196 two-speed combinations are provided in sixteen groups. High and low speeds

can be forward and backward, both in the same direction or in opposite directions. Changes in high speed and ratio are each made by changing one pair of pick-off gears. Direction of low speed, relative to high speed, is changed by merely moving a ratio change-gear from one center to another. Provision is made to reduce the speed of the driving shaft when desired.

When the number of operations required to produce the part permits, faster production can be obtained by designing the cams and setting the trip-dogs to make more than one piece per cycle. Idle machine movements are performed at a constant rapid rate, independent of the spindle speed or rate of production. The swing-

stop for stock, which is independent of the turret, is operated in conjunction with the feeding mechanism. It leaves all six turret holes available for operating tools, and permits using a single tool without indexing.

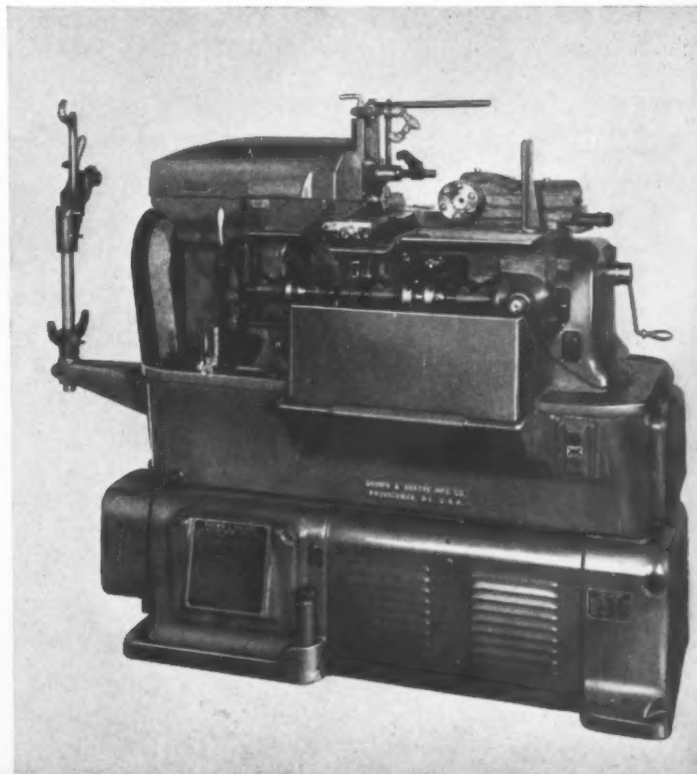
When the starter compartment door is opened, a safety device operates the disconnect switch and shuts off the current. A spring safety device in the stock-feeding mechanism prevents breakage in case of any interference with the advance of the feed-tube. A clutch automatically disengages the drive to the camshafts if the tool-slide mechanisms are subjected to excessive strain.

The hole through the largest regular-capacity feeding finger on the No. 00G machine (Fig. 1) is 3/8 inch in diameter. Spindle speed range is 6050 to 50 R.P.M. The No. 0G machine (Fig. 2), has a hole through the largest regular-capacity feeding finger 5/8 inch in diameter. Spindle speeds for this machine range from 4230 to 35 R.P.M. The automatic cutting-off machines are the same as the automatic screw machines except that a single-tool slide is used in place of the turret.

**Fig. 1. No. 00G High-speed Automatic Screw Machine to be Exhibited by the Brown & Sharpe Mfg. Co.**



**Fig. 2. Brown & Sharpe No. 0G High-speed Automatic Screw Machine, Also to be Exhibited at the Show**





**Fig. 1. Bridgeport Cut-off Machine having a Completely Automatic Cycle, with Hydraulic Feed and Gripping Arrangement**

## ***Bridgeport Automatic Cut-Off Machine and Vertical Surface Grinder***

**Booth 313**

The completely hydraulic automatic cut-off machine seen in Fig. 1 is a new development of the Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn. This machine will handle stock up to 2 inches in diameter, and will automatically cut off the stock in lengths up to 12 feet. The cut-off head consists of a 16-inch diameter cut-off wheel driven by a 10-H.P. motor through a V-belt drive. The head is mounted on a rocker shaft equipped with anti-friction bearings which are sealed against grit. Coolant is supplied to both sides of the wheel by a nozzle that is adjustable to compensate for wheel wear.

The operating cycle of the machine is completely automatic, the

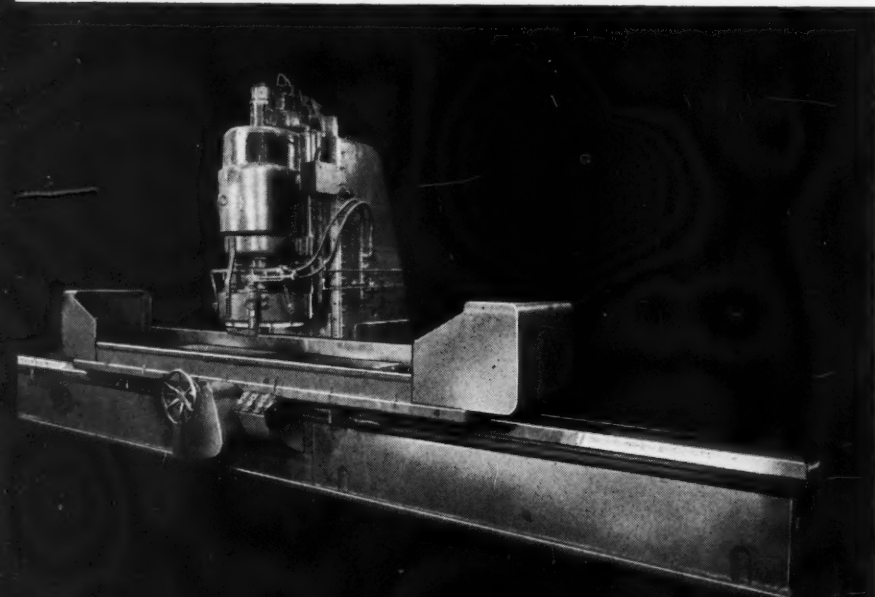
work being automatically fed to the cutting position, gripped hydraulically, and cut off. Both the rate of stock feed and the cutting cycle of the head are adjustable. Hydraulic feed of the cut-off wheel automatically compensates for changes in area when the wheel is cutting. In cutting a piece of bar stock, the wheel feed is much faster at the start and finish of the cut, where the area is small, than it is through the central part of the piece. The wheel is always fed through the work at the limit of its capacity.

The Bridgeport hydraulic vertical surface grinder (Fig. 2) has a reciprocating table 20 inches wide by 100 inches long. Tables from 60 to 240 inches in length

are also available. The grinding head consists of a 26-inch Bridgeport sectional grinding wheel mounted on the flanged end of the spindle. The spindle is assembled with a 50-H.P. electric motor, and its bearings are lubricated by an independent lubrication system which insures a constant supply of oil.

The head is mounted on a heavy column with hardened, square gibbed ways. Counterbalancing of the head is controlled by a hydraulic system. Vertical movement of the head is accomplished hydraulically at speeds up to 30 inches per minute. The table is reciprocated by two single-acting hydraulic cylinders. A range of table speeds up to 200 feet per minute is available for all types of grinding. Two adjustable coolant nozzles are mounted on each side of the grinding wheel, and an additional supply of coolant is supplied through the hollow spindle to insure a flood of coolant.

This grinder can also be furnished with a new electronic sizing device which will be demonstrated at the Show. With this device, the operator need only make a few settings on a control unit, start up the machine, and the grinding cycle is completed automatically when the required surface dimensions are reached. Upon the completion of the cycle, the table automatically stops at the loading position. The machine illustrated is one of three models available.



**Fig. 2. Hydraulic Vertical Surface Grinder to be Exhibited by the Bridgeport Safety Emery Wheel Co.**





*Men Responsible for Results  
in the Machine Tool Using Industries*



Leonard G. Weber, Manager, Tool and Gage Engineering, Stromberg-Carlson Co., Rochester, N. Y.



J. H. Larsen, Superintendent of the Aro Equipment Corporation, Bryan, Ohio



Ivar J. Samuelson, Plant Manager, The Gabriel Co., Cleveland, Ohio



Floyd J. Bird, Factory Manager of the Packard Motor Car Co., Detroit, Mich.



L. F. Uhler, Gen. Supt., Motor Plant No. 4, Packard Electric Div., General Motors Corp., Warren, O.



S. W. Ostrander, General Manufacturing Manager, Pontiac Motor Div., General Motors Corporation



R. A. DeVlieg, Vice-President, Manufacturing, Nash-Kelvinator Corporation, Detroit, Mich.



J. L. Shaw, Production Supt. of Ward LaFrance Truck Div., Great American Industries, Elmira, N. Y.



R. B. Knoch, Manufacturing Engineer, The Western Electric Co., Chicago, Ill.

*Men Responsible for Results  
in the Machine Tool Using Industries*



Harold S. Falk, President of  
the Falk Corporation, Mil-  
waukee, Wis.



C. M. Burgwaldt, Gen. Superin-  
tendent, Manufacture, Mergen-  
thaler Linotype Co., New York



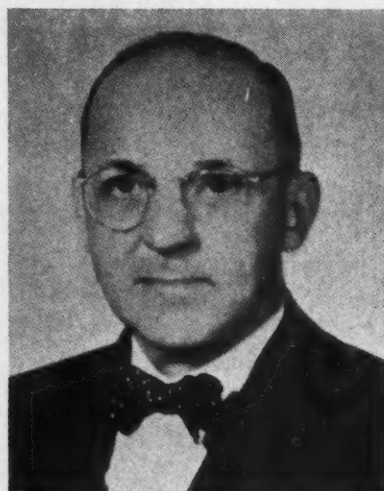
Fred W. Herman, Plant Manager  
and Chief Engineer, Long Beach  
Plant, Douglas Aircraft Co., Inc.



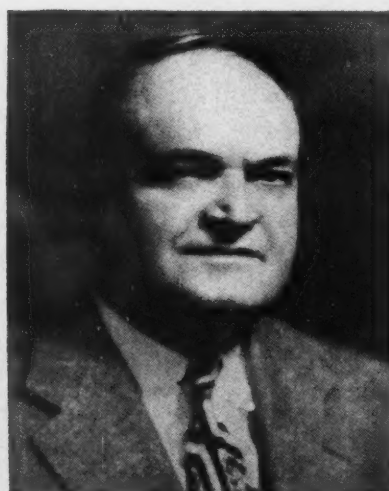
Carl Welin, Works Manager of  
the Mercury Manufacturing Co.,  
Chicago, Ill.



J. C. Miles, Factory Superin-  
tendent, Tokheim Oil Tank and  
Pump Co., Fort Wayne, Ind.



W. H. Volkmar, General Superin-  
tendent, Rockford Works, J. I.  
Case Co., Rockford, Ill.



W. E. Baker, Vice-President,  
Manufacturing, Servel Inc.,  
Evansville, Ind.



Dan C. Teetor, Vice-President,  
Manufacturing, Perfect Circle  
Corporation, Hagerstown, Ind.



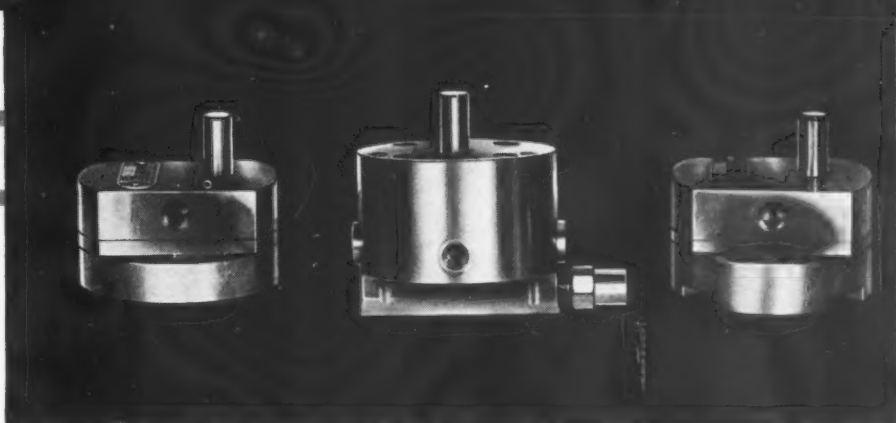
John Lund, Supt., Manufacturing,  
Equip. and Process, John Deere  
Tractor Co., Waterloo, Iowa





TO BE SEEN AT THE SHOW

*Bijur Constant-feed Gear  
Pumps for Use with Pres-  
sure Lubrication Systems*



## *Bijur Constant-Feed Gear Pumps*

**Booth 37-B**

Three new types of constant-feed gear pumps for use with machine pressure lubricating systems will be shown by the Bijur Lubricating Corporation, 43-01 Twenty-second St., Long Island City 1, N. Y. The universal gear pump, seen at the left in the illustration, can be mounted in any position, the direction of drive-shaft rotation determining the direction of flow; the reversible gear pump (at the center) maintains flow in one direction only,

regardless of changes in drive-shaft rotation; and the sump pump, seen at the right, is provided with an integral fine-mesh screen and can be mounted directly in the sump. Each is a small-capacity unit providing a flow of 50 cubic centimeters per minute at a speed of 100 R.P.M. Because of this small delivery, the correct amount of lubricating oil can be fed to the machine without by-passing a high percentage of the output.

## *Pratt & Whitney Jig Grinder*

**Booth 55**

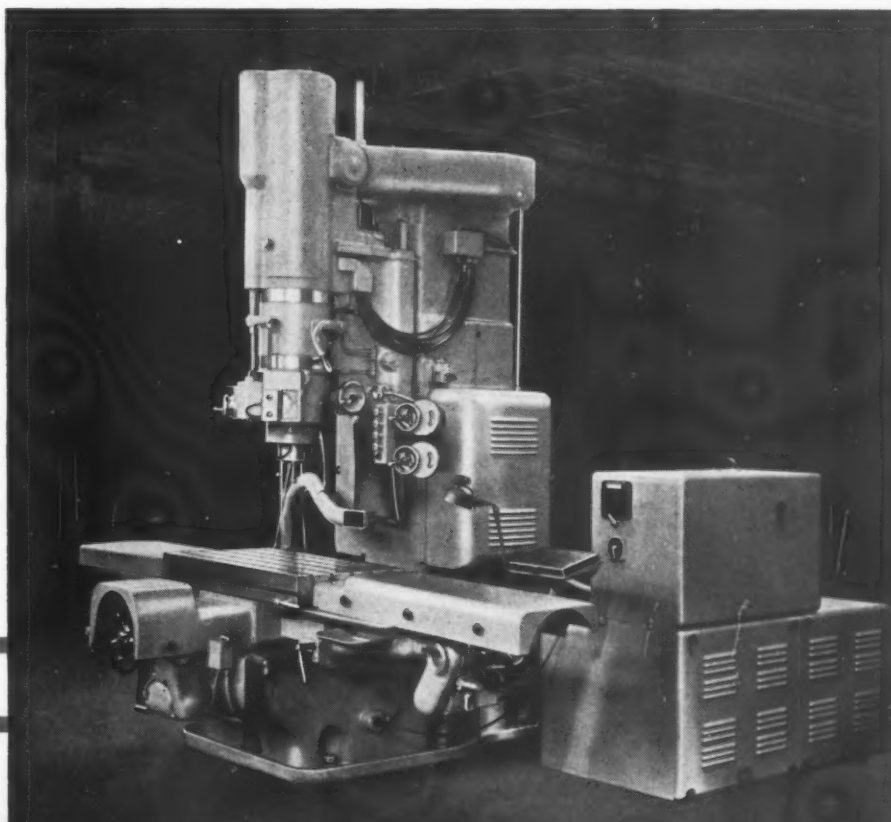
Pratt & Whitney Division Niles-Bement-Pond Co., West Hartford 1, Conn., will demonstrate its new jig grinder, designed for grinding holes to jig-borer spacing and precision-grinding finish. This

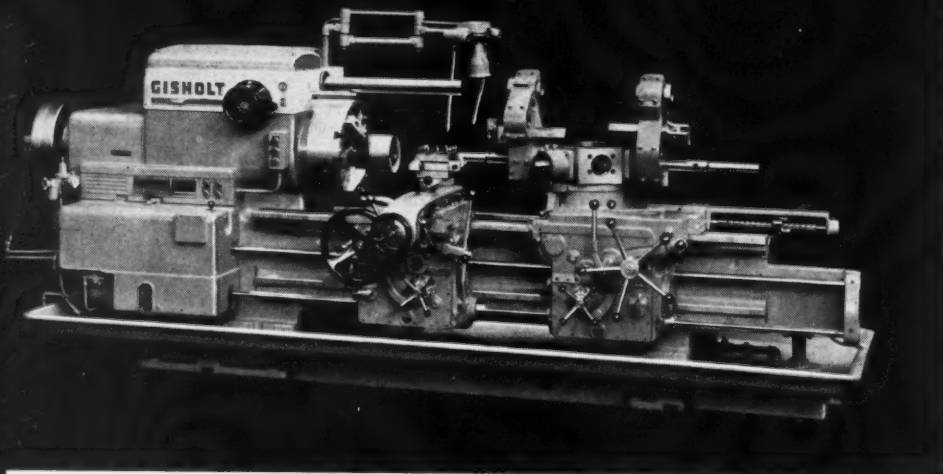
machine was developed as a companion machine to the jig borer. The machine is all-electric. It has a table surface 22 by 44 inches, a 36-inch longitudinal travel, and an 18-inch transverse travel.

The bed, table, and locating mechanisms are similar to a jig borer, and the same measuring instruments are used for spacing. The work does not revolve. The grinding-wheel head has an adjustable circular motion about the vertical axis of the hole being ground, and can be fed outward in an increasingly larger radius until the hole is finished to size. The main spindle is driven by a 3/4-H.P. motor through a variable drive. This produces spindle speeds from 35 to 200 R.P.M. for the adjustable circular motion. A separate reversing motor and variable drive provide power for the spindle vertical travel.

Two wheel-heads are furnished with the machine. The rotors of the wheel-head motors are assembled directly on the wheel-spindles. The smaller head, used for holes up to 1 inch in diameter, has eight speeds ranging from 13,200 to 54,000 R.P.M. The larger one, used for holes from 1 to 5 inches in diameter, has eight speeds

*New Pratt & Whitney Jig  
Grinder, which is Built  
as a Companion Machine  
for the Jig Borer, will be  
on Exhibition at the Show*





## LATEST EQUIPMENT

**Fig. 1. New Saddle Type Turret Lathe to be Exhibited by the Gisholt Machine Co.**

ranging from 6600 to 27,000 R.P.M. The main head has a 15-inch travel on the column face plus a vertical spindle travel of

6 inches. In addition, there is an angular adjustment for grinding tapered holes up to 5 degrees included angle.

### *Gisholt Lathes, Superfinishers, and Milling Machine*

#### Booth 304

Among the new and improved machines to be exhibited by the Gisholt Machine Co., 1209 E. Washington Ave., Madison 3, Wis., will be 1L and 2L saddle type turret lathes, a line of hydraulic and Simplimatic automatic lathes, Fastermatic turret lathes, five Superfinishing machines, static and dynamic balancing machines, and a turn-milling machine for small engine crankshafts.

The 2L lathe shown in Fig. 1 has an 18-inch, three-jaw air chuck and a 16-inch air cylinder. Ease of operation has been obtained by such features as a hydraulic spindle-speed selector and a single feed-change control for both aprons. The 1L model is

equipped with a 12-inch hollow air cylinder, and can be used equally well for bar or chucking work without any alteration of the chucking devices.

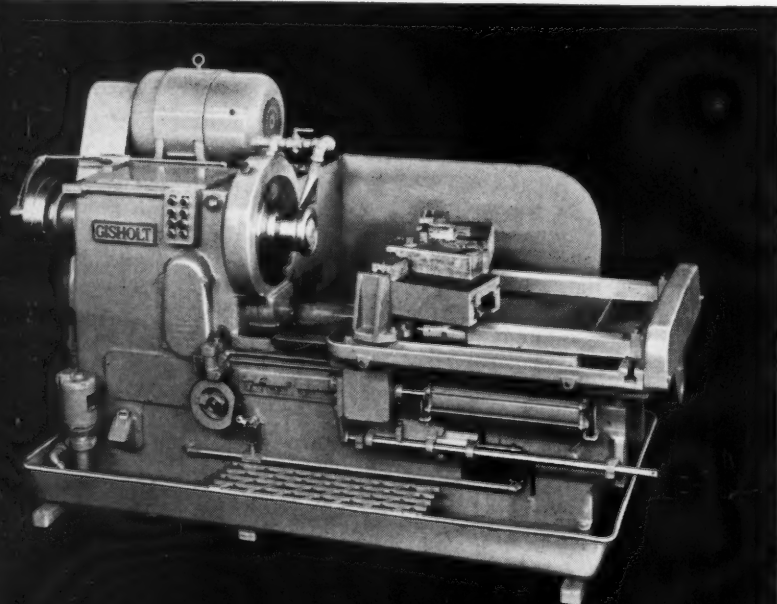
A 28-inch three-jaw air chuck and an 18-inch air cylinder are standard equipment on the 4F Fastermatic turret lathe illustrated in Fig. 3. This new machine is said to be the most powerful lathe of its type ever developed for heavy chucking work.

The Simplimatic lathes will include one platen type (standard flat table) machine and one vertical-carriage machine with fixed tooling mounted on a plunge type head. The platen type lathe, shown in Fig. 2, will be set up to

machine forged-steel bevel gears, employing a special holding fixture and a 12-inch air cylinder.

Included in the line of Superfinishing machines to be demonstrated will be the Model 50—a general-purpose machine—shown in Fig. 4. This type of machine, built in two sizes to handle work up to 4 inches in diameter by 18 or 36 inches long, lends itself especially to general tool-room use, or to the superfinishing of comparatively small lots of a variety of cylindrical parts, with the work driven by collet, roll drive, chuck, or between centers. Under some conditions it is found profitable to equip such a machine with an attachment permitting the performance of spherical work or another attachment for flat work.

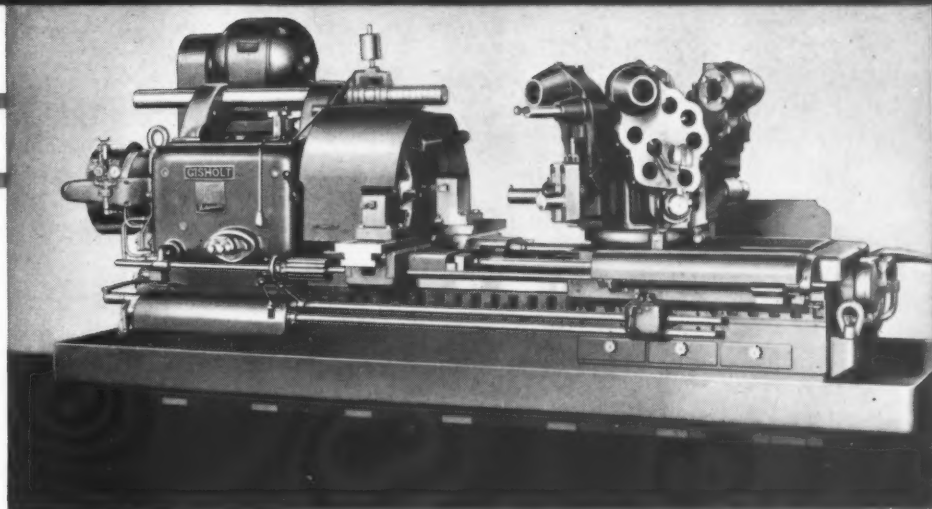
One of the largest machines in the exhibit will be a special turn-milling machine (Fig. 5) for machining all crankpins and facing the adjacent cheeks and counterweights on a crankshaft to a finish for grinding. This machine is designed to produce twenty-four crankshafts in forty-eight minutes. Nine separate motors, com-



**Fig. 2. Platen Type Simplimatic Lathe Designed for High-production Work — Another Gisholt Exhibit**

## TO BE SEEN AT SHOW

**Fig. 3. Gisholt 4F Fast-ermatic Turret Lathe Developed for Heavy Chucking Work**



prising a total of 163 H.P., are employed.

In operation, the two headstocks—which together with their respective multiple master cams are driven in unison from a common drive—rotate the crankshaft. Each cam, mounted rigidly on a work-rotating spindle, controls the movement of three 24-inch diameter milling cutters through hydraulic means, acting on the cutter-slides. The six crankpins are each turn-milled by one of the cutters, which is driven through worm-gearing by its own motor. Four of the cutters move in a vertical plane, and the other two in a horizontal plane; the latter also have a sidewise movement to facilitate loading and unloading.

Other machines to be demonstrated include ram type turret lathes with a new rapid-acting hydraulic bar feed and collet

chuck; and a new semi-automatic balancing machine for measuring and correcting the amount of unbalance in automobile crankshafts. In addition, an automatic work-driver for gripping and driving a piece that is supported on centers will be shown; this is essentially a quick-acting lathe dog designed to provide an increased gripping action as the torque load on the work becomes greater.

### *Di-Acro Notching Shear*

**Booth 13-A**

The Di-Acro notching shear to be exhibited is a flexible unit made by the O'Neil-Irwin Mfg. Co., 332 Eighth Ave., Lake City, Minn., which will rapidly and ac-

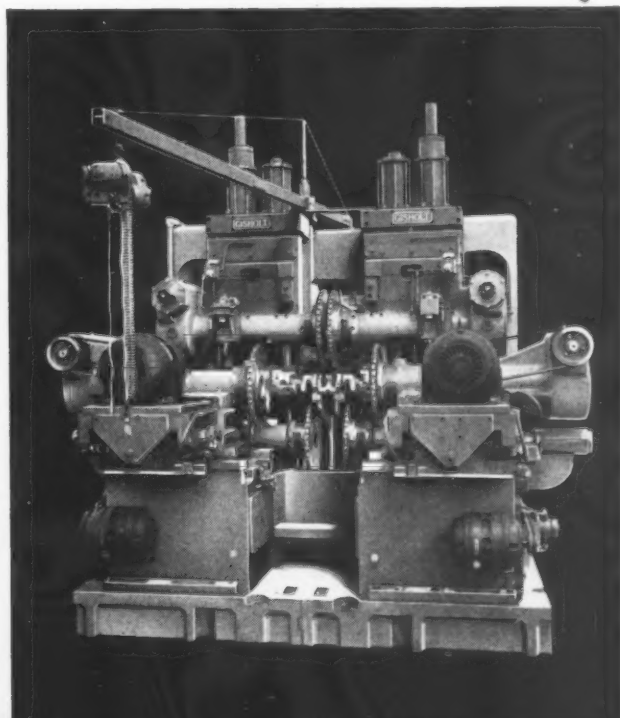
curately make angular cuts in sheet materials without dies. A 90-degree notch of any size within the capacity of the shear can be accurately cut, in a single operation, from either the corner or any other position along the edge of a sheet. It is also possible to shear angles both smaller and larger than 90 degrees.

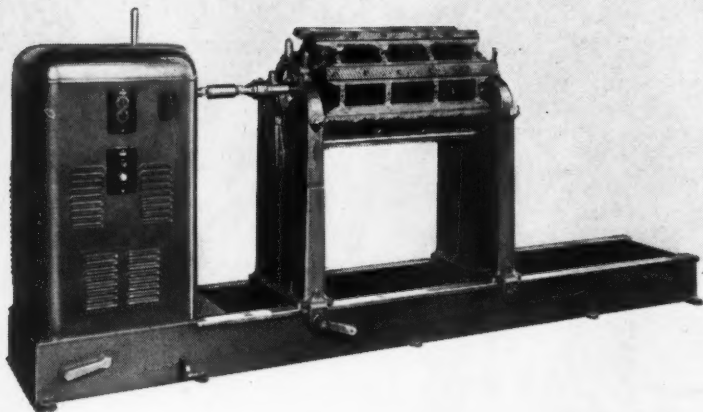
The powerful action of the shear is obtained through a roller-bearing cam arrangement which evenly distributes the shearing pressure simultaneously on both blades. A clean cut, free from rough edges or burrs, is produced by the triangular-shaped ram. The 90-degree pitch of the shear blade provides true shear cutting of materials, with the pitch of the blade advancing progressively through the material with a minimum of contact at the point of material separation.

**Fig. 4. General-purpose Superfinisher, Available for Work up to 4 Inches in Diameter by 18 or 36 Inches Long**



**Fig. 5. Special Gisholt Machine Designed for Milling Crankshafts Preparatory to Grinding**





## *Bear Dynamic Balancing Machine*

**Booth 33-BB**

The Model 375-R dynamic balancing machine illustrated is a new development of the Industrial Division, Bear Mfg. Co., Rock Island, Ill. The cast bed and towers afford sufficient rigidity to carry parts weighing as much as 2000 pounds. A simple roller adjustment enables the operator to easily change the machine set-up from a 1-inch diameter shaft to a 5-inch shaft. The machine has a swing of 60 inches.

The towers can be moved along the 6-foot bed of the machine through a rack and pinion. For driving purposes, a double, universal-joint type drive is em-

ployed. To this can be added either an adapter or a three-jaw, self-centering, balanced scroll chuck. One 3-inch and one 5-inch chuck are available.

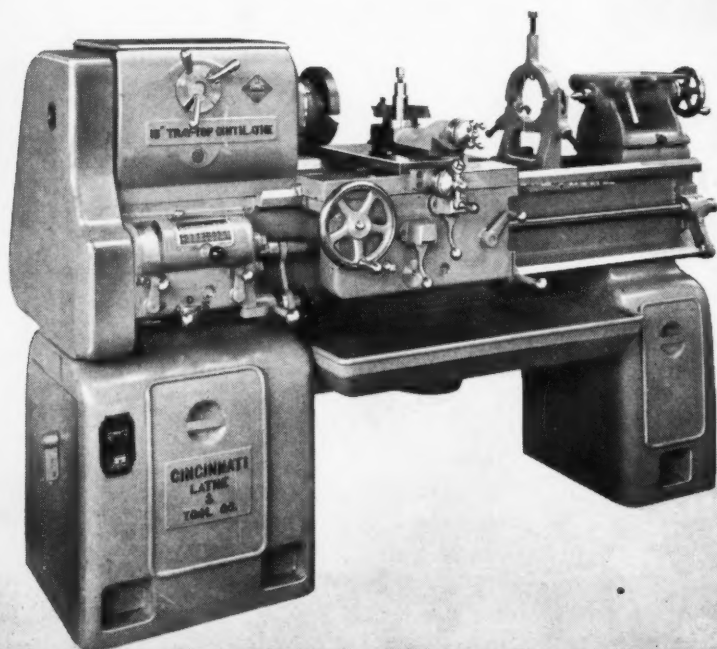
Another feature of this machine is the automatic spark indicating mechanism and dial indicators that enable the operator to remain at the control tower at all times, regardless of the bed length, while the part is in motion. Each tower is equipped with a safety guard, which, when locked in position, will hold the shaft on the rollers and the part in the machine, regardless of the amount of unbalance in the part.

## *Cincinnati Lathes and Contouring Attachment*

**Booth 522**

Two new lathes and a standard engine lathe equipped with a simplified tracing mechanism will be

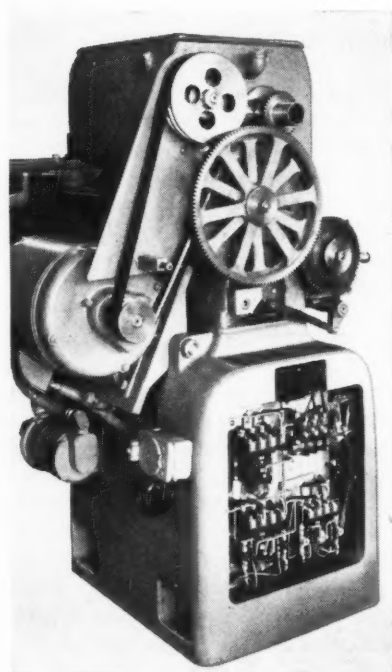
demonstrated at the Machine Tool Show by the Cincinnati Lathe & Tool Co., Oakley, Cincinnati 9,



## *LATEST PRODUCTION*

### *Bear Dynamic Balancing Machine for Parts Weighing as Much as 2000 Pounds*

Ohio. One of the lathes, the "Tray-Top Cintilathe," which is illustrated in Fig. 1, is a light-duty machine designed to handle a wide variety of turning, boring, and threading operations. It is



made in swings of 10, 12 1/2, 15, and 18 inches, with distances between centers from 18 inches up, in increments of 6 inches. Twelve spindle speeds can be obtained on each of these machines, and forty-eight thread and feed changes are available. Only two

**Fig. 1. (Left) New General-purpose "Tray-Top Cintilathe" to be Exhibited by the Cincinnati Lathe & Tool Co.**

**Fig. 2. (Above) Drive and Controls of "Cintilathe," Showing Accessibility**

## EQUIPMENT TO BE SEEN AT THE SHOW

additional change-gears are required to chase metric threads with an English lead-screw or English threads with a metric lead-screw. The machine is available with either of two drives—a direct-coupled motor drive or a multiple-disk friction clutch and brake, both with V-belt. These lathes have self-lubricated bearings and easily accessible motors and controls, as shown in Fig. 2.

The other new lathe, called the "Tracermatic Cintilathe," is a special model for use primarily on molds for bottles, tableware, and other items in the glass industry, embossing dies, and dies for plastics, where extreme accuracy, fineness of detail, and speed of production are required. Ovals, squares, rectangles, etc., with rounded corners and intricate patterns can be produced. In this machine, not only are both the cross and longitudinal (radial and axial) movements of the tool controlled, but the spindle speed is also regulated by the tracer. As a result, the spindle speed is automatically varied as the diameter of the work changes, providing a practically constant cutting speed.

The third machine—the "Contourmatic"—is a standard engine lathe to which has been added a tracing attachment that synchronizes the in and out movements of the cross-slide with the longitudinal movement of the carriage to accurately duplicate the contour of a master templet. This equipment can be employed for work of a circular cross-section, such as multiple-diameter shafts or similar parts which may incorporate grinding necks, tapers in both directions, shoulders, or irregular contours along the axis.

### *Peerless Improved Mechani-Cut Saws*

**Booth 144**

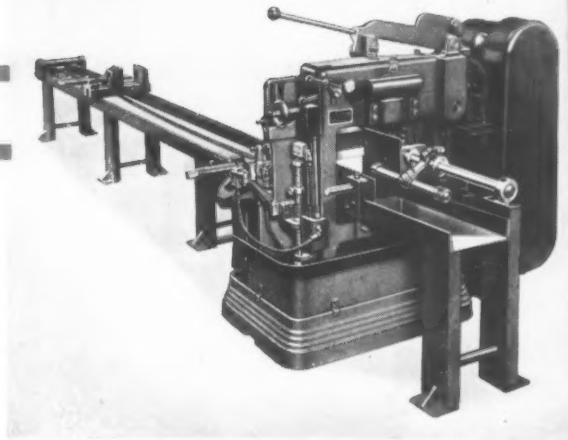
A demonstration of automatic sawing on an improved 7- by 7-inch Mechani-Cut saw with an

### *"Mechani-Cut" Power Saw Built by Peerless Machine Co.*

automatic length gage for gaging lengths 1/8 inch to 48 inches will be made by the Peerless Machine Co., Racine, Wis. Metal is fed forward through a four-sided saw frame which surrounds the metal to be cut instead of straddling over the work. In order to permit maximum pressure on the saw blade without shortening the

blade life unduly, a unique type plate is provided to back up the blade. High capacity and longer blade life are advantages claimed for the new machine.

A saw-blade grinder that will correctly sharpen used blades from three to six times is another new product of the company to be announced.



### *Buhr Driller, Tapper, and Indexing Tables*

**Booth 158**

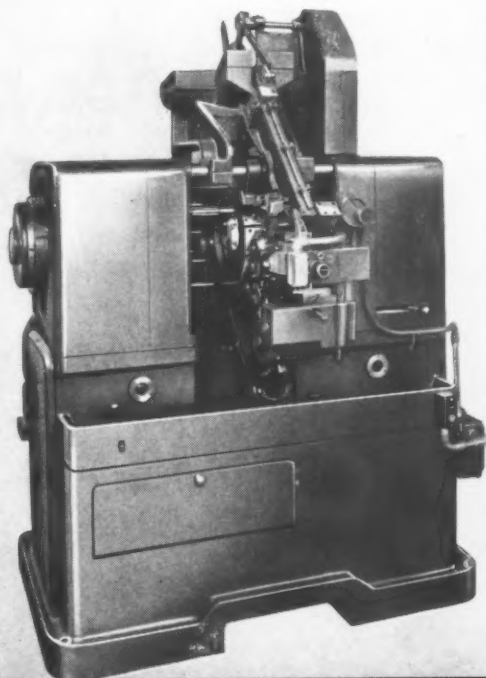
A fully automatic double-end driller, known as the "Buhrmatic," for the production drilling of crossed holes and a bench tapper equipped for selective full-automatic cycling or hand operation are to be displayed by the Buhr Machine Tool Co., 843 Green St., Ann Arbor, Mich.

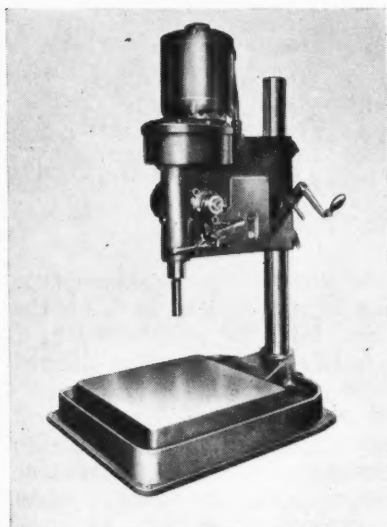
The "Buhrmatic," shown in Fig. 1, is designed with eight work stations and a loading and unloading station. Hopper fed, it can be operated in batteries of four by one operator; parts are

loaded in one "bulk" handling and ejected automatically. Safety devices are incorporated to stop the machine should broken tools or other damage impede the process.

The original machine, which was designed to drill, ream, and countersink two holes in a 5/16-inch bolt, had an output of 960 pieces per hour at 80 per cent efficiency. New developments show the machine to be adaptable for machining other parts, such as bushings, bearings, or pins that are required in great volume.

**Fig. 1. "Buhrmatic"  
Double-end Driller for  
Production Drilling,  
Reaming, and Counter-  
sinking of Crossed Holes**





**Fig. 2. Buhr Bench Tapper, which is Equipped for Automatic Cycling or Hand Operation**

The bench tapper is equipped to handle taps from No. 4 to 5/16 inch in diameter when working on cast iron, or to 1/4 inch in diameter when working on steel. Class 3 fits can be obtained under normal operating conditions. A 1/3-H.P., 1800-R.P.M., three-phase, 220-volt ball-bearing motor drives the machine. Dimensions of the tapper are as follows: Swing, spindle to column, 10 7/8 inches; spindle diameter, 1 5/8 inches; maximum vertical travel, 2 7/16 inches; base, 17 by 22 1/2 inches. The solid 2 1/4-inch column may be replaced with one of extra length should the standard 15 1/4-inch clearance under the spindle be insufficient for the requirements.

Besides these machines, the company is also exhibiting electric-powered, geared, and hand-operated index-tables. In the power

unit, power transmission is through a worm and worm-gear to a roller type cam track. The table is carried on ball bearings and is centralized by a heavy ball-bearing

ing spindle. This table is produced in seven diameters, from 10 to 48 inches. It can be adapted to operate either in the vertical or horizontal plane.

## Barnes Drilling Machine and Hydraulic Unit

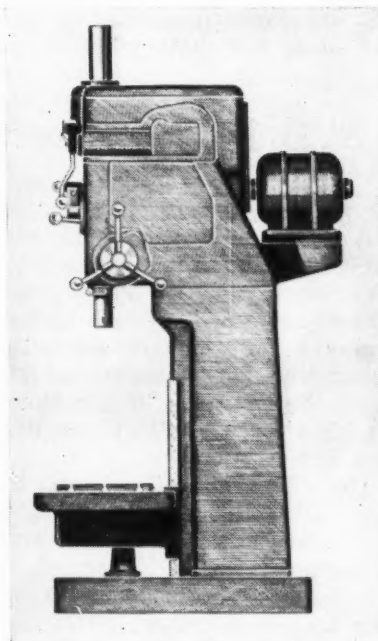
Booth 42

A new production drilling machine will be demonstrated by the Barnes Drill Co., 814-830 Chestnut St., Rockford, Ill. A feature of this machine (Fig. 1) is a wide

improved feed-engagement control is also included.

The new hydraulic unit shown in Fig. 2 is of 2-H.P. capacity, and is equipped with air traverse for rapid approach, hydraulic feed, and air traverse for rapid return. These features make the unit desirable for high-production machines with a rapid approach and return. By the use of the hydraulic feature, high feed pressures can be obtained. This unit will be incorporated in a special high-production machine which will be on display.

Also to be exhibited are a special high-production machine incorporating a 25-H.P. hydraulic unit; a 15-H.P. self-contained air-cooled unit; a hydraulic honing machine with 12-inch stroke and capacity for 2-inch diameter work; a honing machine incorporating electronic and hydraulic controls; and a cylinder honing machine designed for handling large work.



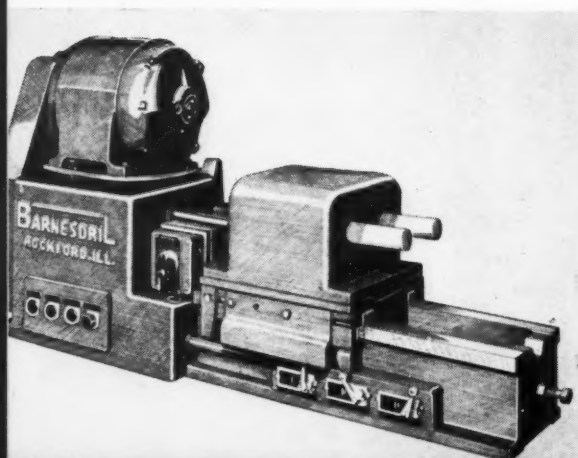
**Fig. 1. Barnes Drilling Machine with Twelve Speeds and Nine Feeds**

## Scherr Optical Comparator and Toolmaker's Microscope

Booth 663

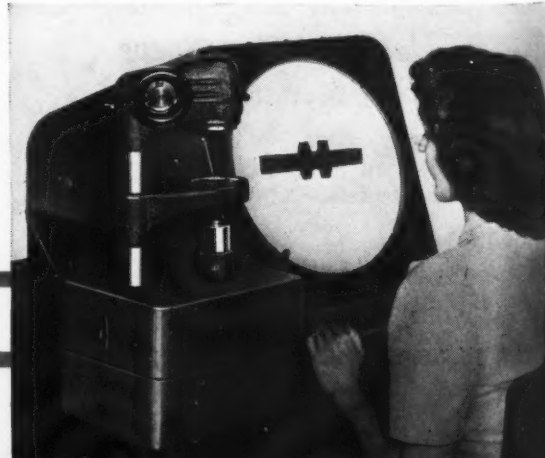
An entirely new model of optical comparator, suitable both for shadow images in transmitted light and reflected images by sur-

range of speeds and feeds, including twelve speeds and nine feeds, both selected by dial control. An



**Fig. 2. (Left) Barnes Hydraulic Unit with Air Traverse**

**(Right) Scherr Optical Comparator**



face illumination, will be seen for the first time at the exhibit of the George Scherr Co., Inc., 200 Lafayette St., New York 12, N. Y. It is of horizontal design for bench use. The beam of light is vertical, through a stage in a horizontal position. The comparator includes a circular screen 14 1/2 inches in diameter.

Also to be shown for the first

time is a new model of toolmaker's microscope for measurements in two dimensions with a range of 2 inches by 1 inch. It will include the following features: An erect image in both directions; inclination of the microscope post to the helix angle of threads; and a sharply defined, 30 magnification image on a clear glass reticule.

## Geometric Convertible Die-Heads and "Supermetric" Chasers

Booth 50

An improved Style DS convertible self-opening die-head embodying many new features will be exhibited by the Geometric Tool Co., New Haven 15, Conn. This die-head (Fig. 1) can be adapted for four different types of application by a simple adjustment. The new die-head is built in six sizes with a cutting range from 1/16 inch to 1 3/4 inches.

The combination features of this head permit its application on practically all types of single-spindle automatic and hand screw machine set-ups where the die-head does not rotate. The head is adjustable and can be set for pull-off trip or outside trip on automatics or it can be set for either pull-off or outside trip on hand machine applications by simply removing the closing pin and inserting in its place a closing handle.

A floating shank of the double buffer type allows this head to yield slightly in starting, thus insuring a smooth thread at the start. This also makes close camming for lead unnecessary. Because of its light construction

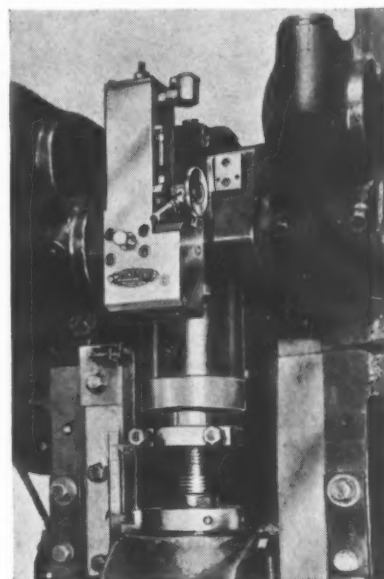
and sensitive tripping action, this head is especially suitable for cutting fine-pitch threads of short lengths.

"Supermetric" chasers (also to be exhibited) are designed to obtain a high degree of finish and accuracy on the work and to have increased life. All threads and other surfaces of these chasers are ground to a high finish by a new method of manufacture. These ground-thread chasers are available in all National Standard thread sizes for the 5/16-inch Style DS and Style DJ die-heads in both regular and projection types, and other sizes are being developed.

## Dayton Rogers Compensating Pitman

Booth 14-C

Overload on power presses can be compensated for by a hydraulic overload pitman which will be demonstrated by the Dayton Rog-



Dayton Rogers Hydraulic  
Overload Compensating  
Punch Press Pitman

ers Mfg. Co., 2835 Twelfth Ave. S., Minneapolis 7, Minn. This hydraulic pitman will also insure a constant working pressure, compensating for stock thickness variation. It eliminates undue strain on the power press, avoiding the bending of the crank, fracturing of the bed frame, or excessive strain on the tools and dies.

The hydraulic linkage can be arranged to protect any given tonnage, either the maximum tonnage of the press or the tonnage at which tools can be used. These pitmans are being manufactured in sizes suitable for presses with working pressures from 30 to 500 tons. The installation is comparatively simple, as the compensating pitman can be substituted for the one on the press.

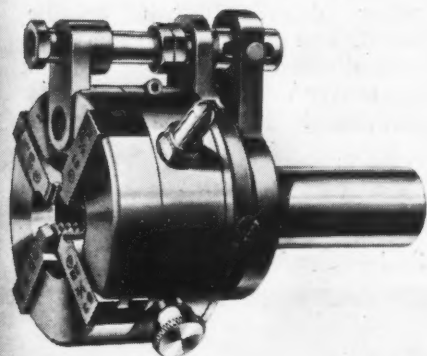
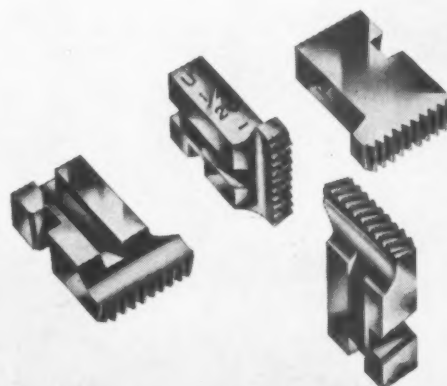
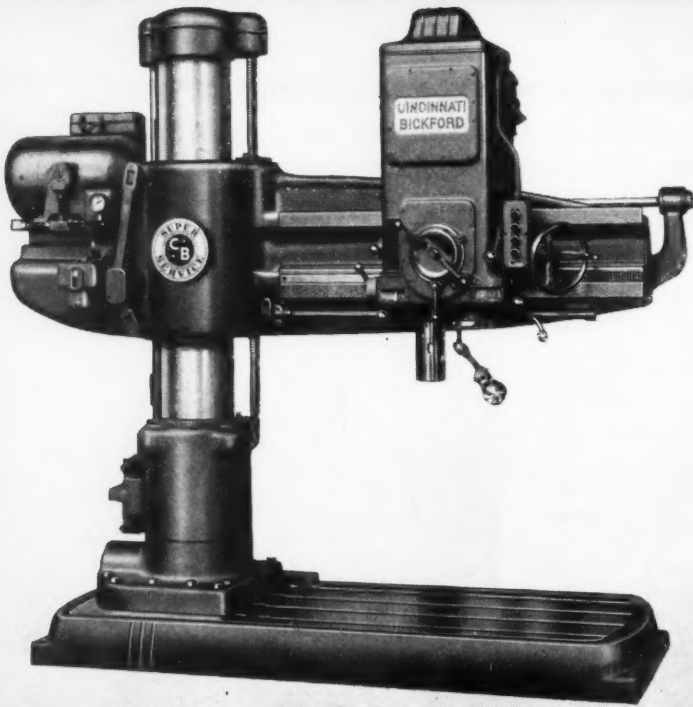


Fig. 1. (Left) Geometric Convertible Self-opening Die-head

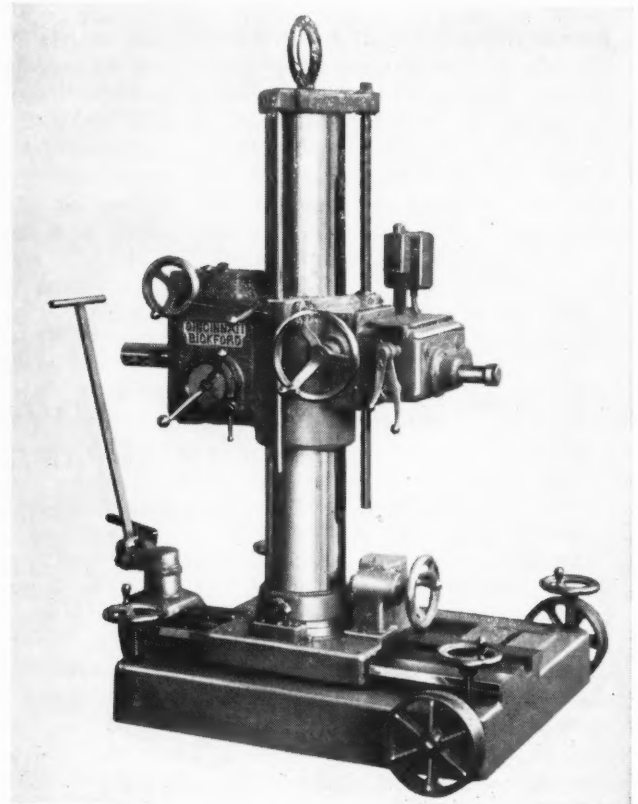
Fig. 2. (Right) "Supermetric" Ground-thread Chasers



## LATEST PRODUCTION EQUIPMENT

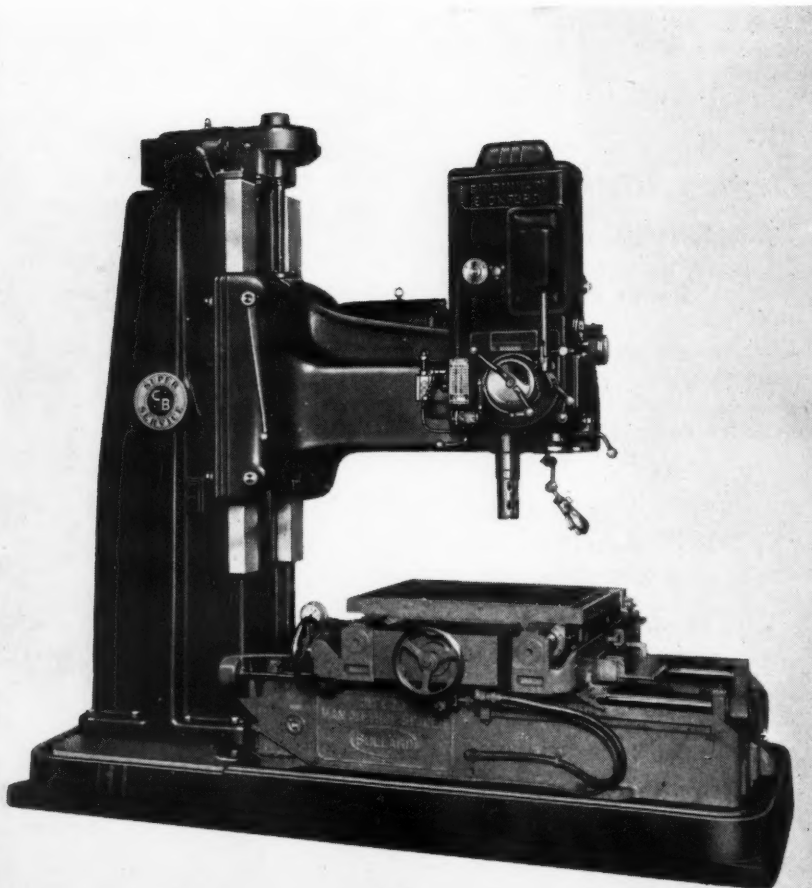


**Fig. 1. (Above) Cincinnati Bickford Radial Drilling Machine Equipped with Hydraulic Arm and Column Clamp**



**Fig. 2. (Right) Portable Horizontal Drilling Machine to be Exhibited at the Show by the Cincinnati Bickford Tool Co.**

**Fig. 3. (Below) "Super Service" Precision Drilling Machine Equipped with Hydraulic Compound Spacer Table**



## Cincinnati Bickford Drilling Machines

Booth 514

A simplified type of "Super Service" radial drilling machine (Fig. 1) will be displayed by the Cincinnati Bickford Tool Co., Cincinnati 9, Ohio. This machine has an 11-inch column, a hydraulic arm and column clamp, twelve speeds, and six feeds. All controls are centrally located at the head. A larger radial drill, having a 17-inch column, eighteen feeds, and thirty-six speeds, as well as hydraulic arm and column clamping mechanism, will also be featured at the Show.

Three special machines will also be exhibited. One of these—a portable horizontal drilling machine (Fig. 2) has a reversing motor drive, 10-inch spindle travel, and hand feed. The vertical distance from the floor to the center of the spindle on this machine is adjustable by hand

## TO BE SEEN AT THE MACHINE TOOL SHOW

from a minimum of 2 feet to a maximum of 5 feet. Six mechanical spindle speed changes from 100 to 950 R.P.M. are provided. The column is mounted on a slide permitting a 2-foot horizontal adjustment by hand. Four adjusting screws, turned by means of a handwheel, facilitate leveling and raise the machine off its three supporting wheels.

The other two special machines to be shown are a "Super Service" precision drilling machine de-

***Inclinable Press Built by Hydraulic Press Mfg. Co., which is Designed for Pressures up to 50 Tons at Speeds of 100 Strokes per Minute***

signed especially for the use of a hydraulic compound spacer table (Fig. 3) and a "Super Service" jig-boring machine.

### ***Henry & Wright "Speedmaster" Dieing Machine***

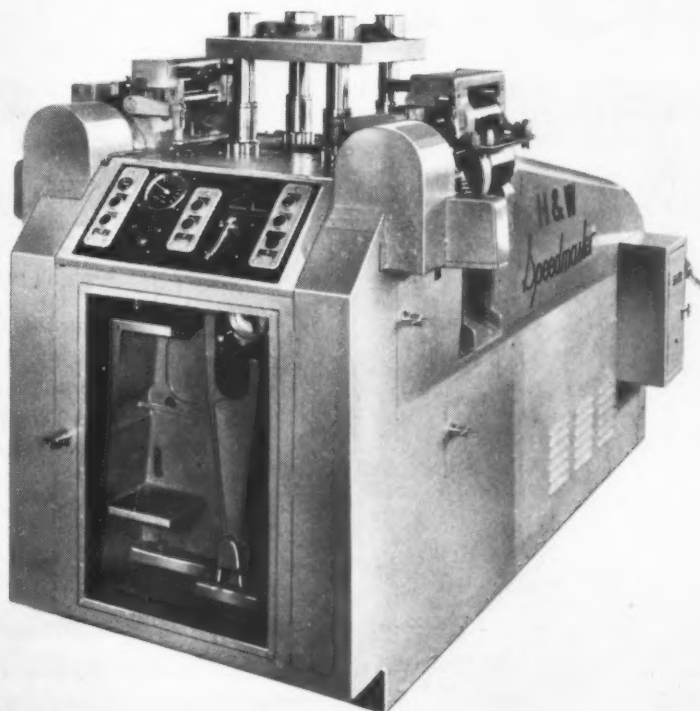
**Booth 131**

Precision guiding for carbide and high-carbon, high-chromium dies and a speed range designed to provide maximum die life are features of the new 25-ton "Speedmaster" dieing machine to be shown by the Henry & Wright Mfg. Co., 466 Windsor St., Hartford 1, Conn. This machine is equipped with a counterbalance mechanism that reduces vibration to such an extent that the machine has been operated at top speed without being fastened to the floor. It is driven by a variable-speed transmission through a pneumatically actuated friction clutch which is electrically controlled by push-buttons. Single-stroke, non-repeat operation, continuous operation, and jogging are provided for.

The braking cycle is adjusted by a new brake synchronizer that stops the machine at the top of its stroke, regardless of the operating speed. Automatic lubrication is supplied to all principal bearings. Provision has been made to permit the use of a simplified form of stacking chute.

***New 25-ton "Speedmaster" Dieing Machine Made by Henry & Wright Mfg. Co.***

The machine is equipped with a double roll feed, the right-hand unit being arranged to be quickly swung open for insertion or removal of long dies. Both feeds are vertically adjustable, and the metal line height can be read from a graduated scale. The machine is provided with a speed range of 235 to 700 strokes per minute, although tests indicate that the latter value can actually be exceeded.

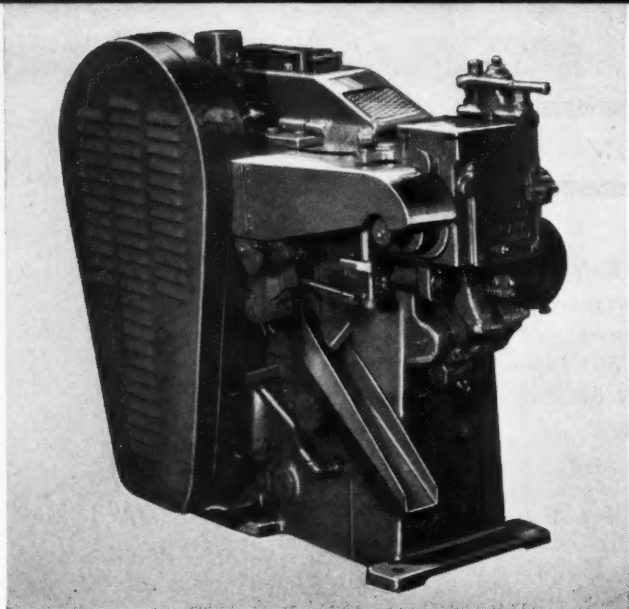


### ***New Hydraulic Inclinable Press***

**Booth 625**

An all-hydraulic inclinable press that can be set for a semi-automatic or a fully automatic cycle, can be tilted to angles of 10, 20, or 30 degrees, and is capable of speeds of up to 100 strokes per minute will be displayed by the





**Fig. 1. Automatic Hollow Rivet Header  
Made by the National Machinery Co.**



**Fig. 2. National Double-stroke Cold-  
header Equipped with a Solid Die**

Hydraulic Press Mfg. Co., Mount Gilead, Ohio. The operating controls provide for instantaneous cycle start and precision inching. Pressures from 15 to 50 tons are applied by a direct-acting hydraulic ram incorporating booster rams for rapid advance and return. The closing speed of the press is 984 inches per minute, the working speed, 84 inches per minute, and the opening speed 790 inches per minute. The ram speed is adjustable (though constant throughout the working

stroke) at whatever setting is selected. Power is supplied by a 7 1/2-H.P., 1800-R.P.M. motor directly connected to a radial pump.

The new machine, known as the "Economy" press has an all-steel welded and stress-relieved frame with a 16-inch opening. The working stroke is 4 inches, of which the last 1 inch is at maximum pressure, and the press reverses automatically when the predetermined pressure is reached. A gage indicates the pressure conditions.

length and uniformity of wall thickness. The end to be riveted is square. Tool life on this machine is many times that previously obtained.

Another machine—a 1/4-inch capacity, double-stroke, solid-die cold-header (Fig. 2) will be in production on Phillips screws. In addition, a 5/16-inch machine of the same type will be operated at extremely slow speed to show how the machine functions.

Hexagonal-head cap-screws will be produced to a Class III fit, at the rate of 85 per minute, on a 3/8-inch capacity bolt-making machine. The wire will be fed into the machine automatically, and the operations of cutting off, extruding, heading, trimming, pointing, and roll threading will be accomplished simultaneously, a complete screw being made on each stroke of the machine. By virtue of the cold-working, the strength of the screw is increased over that of the wire from which it is made.

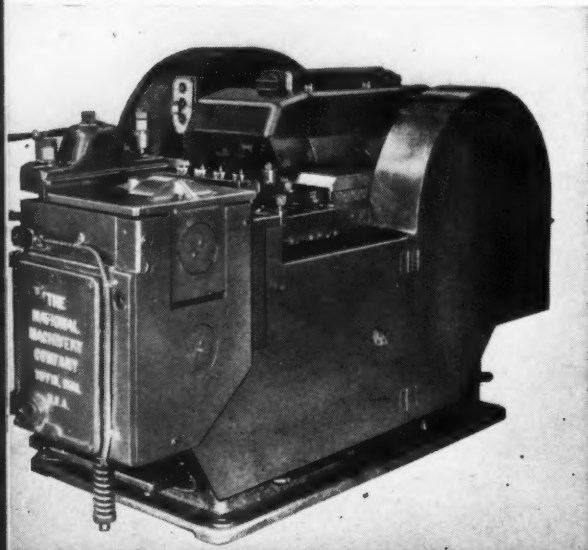
A fully automatic, 5/16-inch capacity, cold nut-forming machine (Fig. 3), also entirely new in principle, will be shown. This machine makes single chamfered, washer-faced nuts and many other standard and special nuts. Round stock is automatically fed into the machine from a coil, and a finished nut, ready for tapping, is produced on each stroke. S.A.E. 3/8-inch nuts can be produced at the rate

## ***National Heading, Tapping, and Forging Machines***

### **Booth 17**

A 3/16-inch automatic hollow rivet header of entirely new principle (Fig. 1) will be displayed by the National Machinery Co., Tiffin, Ohio. Wire is automatically

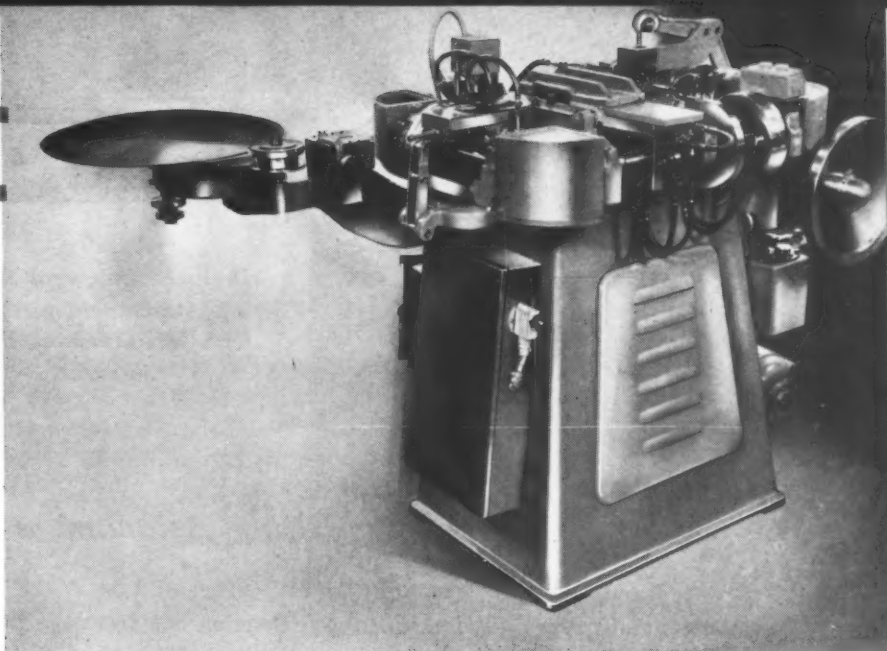
fed into the machine from a coil, and hollow rivets are produced at the rate of 125 per minute. Rivets produced on this machine are pierced, thus insuring accuracy of



**Fig. 3. Automatic Cold  
Nut Former of 5/16-  
inch Capacity—Another  
Exhibit of the National  
Machinery Co.**

## MACHINE TOOL SHOW

*Small High-speed Multi-Slide Machine to be Exhibited at the Show by the U. S. Tool Company*



of 100 per minute. Scrap loss is only half that of previous equipment, and more accurate, better finished nuts are produced.

Also to be displayed are a 3/8-

inch capacity, automatic high-speed nut-tapping machine; a 1-inch capacity hot-forging machine; and a No. 1 1/2 high-speed forging "Maxipres."

### *Kaukauna Portable Drilling and Tapping Machines*

**Booth 117**

Portable horizontal drilling and tapping machines to be featured at the exhibit of the Kaukauna Machine Corporation, Kaukauna, Wis., will include a No. 1030 machine having a 3-inch diameter Nitralloy steel spindle with a 24-inch travel. The head can be swiveled 45 degrees up or down from the horizontal. The head slide is mounted on the vertical 16-inch diameter column, permitting it to be raised or lowered 48 inches by rapid traverse or "inching." The column can be rotated through 360 degrees. The column also has a horizontal movement of 48 inches. Nine speeds from 45 to 800 or 35 to 600 R.P.M. are available. Three power feeds of 0.003, 0.007, and 0.012 inch per revolution can be obtained. Tapping to a depth of 5 inches is possible with the automatic device furnished.

The No. 125-HR portable machine illustrated has its head mounted on two horizontal rails which have a 24-inch horizontal adjustment. The spindle has a

12-inch travel, thus providing a total of 36 inches of spindle movement radially from the center of the column. The spindle diameter is 2 1/2 inches and the column diameter 14 inches. The number and range of speeds and feeds, and other features of this machine, are similar to those of the No. 1030 model drilling and tapping machine.

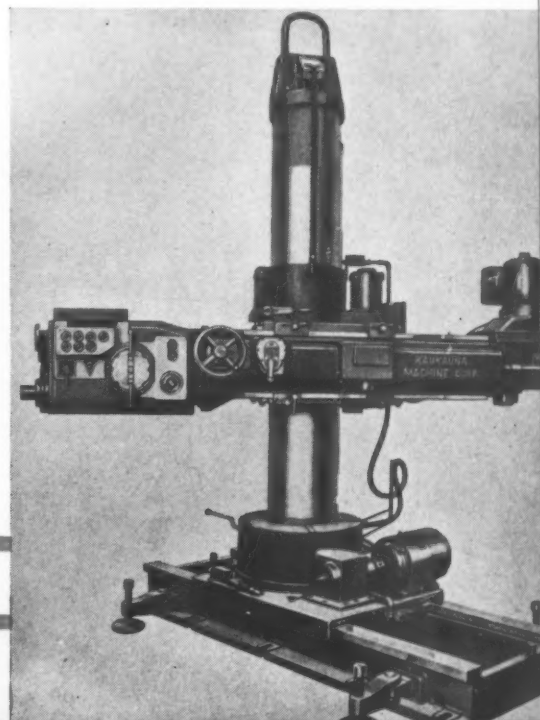
*Kaukauna Portable Horizontal Tapping and Drilling Machine with 36-inch Spindle Travel*

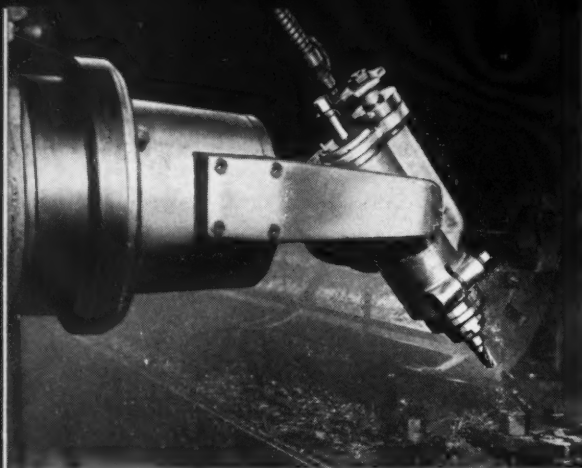
### *U. S. Tool Multi-Slide Machine*

**Booth 236**

A new smaller size Multi-Slide machine will be displayed by the U. S. Tool Company, Inc., Ampere (East Orange), N. J. This No. 11 machine has been designed for high-speed operation, and all moving parts have been made as small as possible. Automatic lubrication and a variable-speed drive from a 1-H.P. motor are features.

Material up to 3/4 inch wide and 1/32 inch thick can be handled. A feed length of 3 inches per stroke is obtainable. The ram or die-head stroke is 5/16 inch, and the forming slide stroke 1 1/4 inches. Up to 500 strokes per minute can be used in stamping small formed parts from coil stock.





## LATEST PRODUCTION EQUIPMENT

### *Defiance Universal Milling Attachment for Use with a Horizontal Boring Mill*

#### *Defiance Universal Milling Attachment*

**Booth 118**

A universal milling attachment that increases the scope of the Defiance No. 25A horizontal boring mill will be shown by the Defiance Machine Works, Defiance, Ohio. Constructed with an outboard bearing to eliminate overhang, the attachment permits heavier cuts and greater precision. It is designed to use a 2 1/2-inch diameter facing cutter, with a 2 1/2-inch spindle adjustment. The standard spindle is furnished to run at the same speed as the boring mill, but it can also be provided with a speed ratio of 1 1/2 to 1 or 1 7/8 to 1. The "reach"

or extension out from the face of the spindle case on the boring mill is 18 inches.

Precision milling and drilling can be done at an angle in any direction. A flat face can be milled at any angle concentric with the spindle or at right angles or parallel to the spindle. The head is set at an angle of 45 degrees from the horizontal in the illustration and has completed a milled slot lengthwise in the work. The head can be turned at any angle concentric with the spindle to mill slots in the end of the work-piece.

of handling angles up to 1 1/2 by 1 1/2 by 3/16 inch (leg out) and up to 1 1/4 by 1 1/4 by 3/16 inch (leg in), as well as 12-gage tubing up to 1 inch in diameter. It operates at a speed of 17 1/2 feet per minute. This unit weighs 1850 pounds, and is 62 inches high, 34 inches wide, and approximately 70 inches long.

Another development is a locomotive-spring punch and shear. This machine is capable of cold-shearing spring leaves 7 inches by 3/4 inch in size. It operates at 22 strokes per minute, weighs 10,000 pounds, and is about 6 1/2 feet high, 6 feet wide, and 6 1/2 feet long.

### *Davis & Thompson Milling and Drilling Machines*

**Booth 201**

Davis & Thompson Co., Milwaukee 14, Wis., will demonstrate the following Roto-Matic machine tools, featuring automatic clamping or quick hand-clamping of work-pieces. Predetermined feeds fix the available time for the operations and set the pace for the machine operator.

A No. 1-A Roto-Matic continuous rotary double-end, drum type milling machine is equipped with automatic chain clamping for rough- and finish-milling of front suspension control arm trunnions. A No. 2-A Roto-Matic continuous rotary double-end, drum type milling machine features a fixture designed to hold a variety of sizes of bearing caps while rough- and finish-milling the bottom, joint faces, sides, and ends. All cutter-spindles on this machine have micrometer endwise adjustment. In addition, the finishing spindles have an adjustment for heel clearance of the cutters.

A No. 8-LV Roto-Matic vertical eight-spindle continuous drilling machine has each spindle

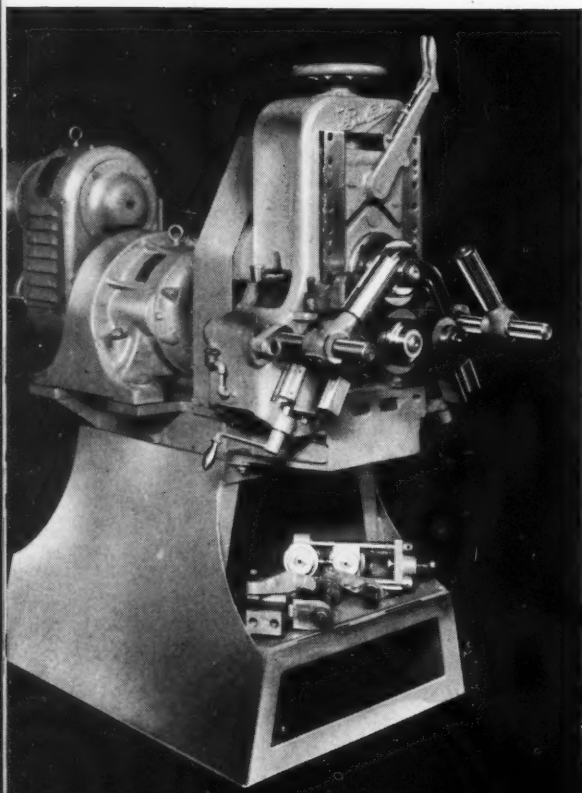
### *Buffalo Forge Co. to Show New Bending Roll*

**Booth 616**

A new Type 0A bending roll for bending light sections into arcs, spirals, or circles will be on dis-

play at the booth of the Buffalo Forge Co., 440 Broadway, Buffalo 5, N. Y. This machine is capable

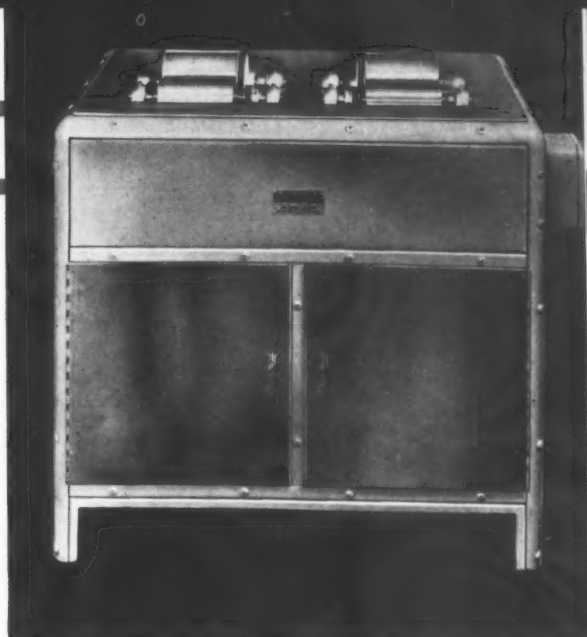
*New Bending Roll which is Designed for Bending Light Sections, to be Displayed at the Show by the Buffalo Forge Co.*



## TO BE SEEN AT THE SHOW

equipped with a two-spindle drill head for drilling two 33/64-inch holes in spindle arms. The clamping of pieces is automatic, and the spindle feed is through a fixed cam. A 12-V Roto-Matic vertical twelve-spindle continuous drilling machine has six spindles provided with fixtures for drilling 1 7/8-inch holes in one type gear, while the other six spindles drill 1 3/4-inch holes in another type gear. Clamping and spindle feed are automatic.

*Centerless Lapping Machine Manufactured by the Size Control Co. Division of American Gage & Machine Co.*



### Michigan Gear-Finishing Machines

Booth 426

A new line of high-production crossed-axis rotary gear-finishing machines, consisting of two models in three sizes each, will be featured at the Show by the Michigan Tool Co., 7171 E. McNichols Road, Detroit 12, Mich. The "870-A Underpass" machine illustrated permits selection of any one of the following three methods of gear finishing: Underpass shaving, in which the work moves tangentially in relation to the cutter; transverse shaving, in which the work is reciprocated axially and the feed is radial; and "Traverpass" shaving—a new development representing a combination of underpass and transverse shaving in which the work moves obliquely relative to the cutter. Ability to select any of the three methods makes it possible to finish all kinds of gears and short or long involute splines. To select any of the three methods, it is only necessary to rotate the slide for the work-head into the proper position.

For applications where extremely wide gears or long splines do not have to be provided for, the gear-finisher is available without the up-feed movement of the knee; this model is known as the "870 Underpass." Features of this model include a quick-acting cam-lock tailstock; location of the work above the cutter to simplify loading; and a new type of machine guard with a rotary-action

lift cover which completely shrouds the cutter and work during cutting. A motor-driven cone drive, geared, 30 to 1 speed reducer is used in the machine head for the slide movement. An electrical control panel is provided for automatic machine cycle.

Both models of these machines are available in three sizes, handling gears up to 8, 12, and 18 inches, respectively. The minimum diameter of gears is 1 inch in all cases, with maximum face width of 5 inches on standard centers. The maximum distance between centers is 26 1/2 inches. The machines will take 10-inch cutters.

*"Underpass" Machine that Permits Selecting Any One of Three Gear-finishing Methods, to be Exhibited by Michigan Tool Co.*



### Centerless Lapper

Booth 401

The centerless lapping machine to be exhibited by the Size Control Co., Division of American Gage & Machine Co., 2500 Washington Blvd., Chicago, Ill., is designed to give a precision finish of less than 2 micro-inches on cylindrical parts. These lapping machines require no special skill for their operation, nor are special tools or costly set-ups necessary. Both rough- and finish-lapping operations can be performed on the dual rolls of this machine.

A comprehensive line of gages will also be exhibited, including reversible "Go" and "No Go" plug and thread gages, snap and ring

**Fig. 1. (Left) Baker Crank-action Type Machine Designed for Cutting Keyways**

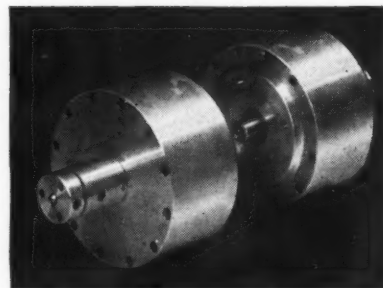
**Fig. 2. (Below Left) Hydraulic Feed Unit with Automatic Cycle to be Exhibited by Baker Brothers, Inc.**

## Skinner Chucking Equipment

Booth 638

The high-speed rotating air cylinders to be shown by the Skinner Chuck Co., 342 Church St., New Britain, Conn., are recommended for installation on drill presses and other machines operating at speeds up to 3000 R.P.M. These cylinders, in sizes from 4 1/2 to 12 inches in diameter, are made of aluminum-alloy forgings.

This equipment combines in a single unit, requiring minimum space, a standard air chuck and non-rotating cylinder holding unit.



**Fig. 1. Front and Rear Views of Skinner Aluminum Rotating Air Cylinders**

The hand-operating valve can be mounted on the unit or separately. The unit can be made up of any standard Skinner air chuck mounted on a cylinder of the proper size to develop the holding pressures required.

A small solenoid valve for use with 1/8- to 3/8-inch pipe will also be displayed. Soft synthetic inserts on stainless-steel seats prevent leakage. These valves are spring-loaded to insure positive closing in any position, and all standard valves are suitable for continuous or intermittent duty.

gages, and Norbide gages. An animated reversible gage, several feet long and mechanically operated, arranged especially to illus-

trate the advantages of this particular type of work inspection instrument, will be a feature of the display.

## New Equipment to be Exhibited by Baker Brothers

Booth 639

A detachable hydraulic pump unit of new and different design, featuring direct electric control of the advance feed, return, and neutral cycle, will be demonstrated by Baker Brothers, Inc., Toledo 10, Ohio. The pump is incorporated in an outside pump-sump system.

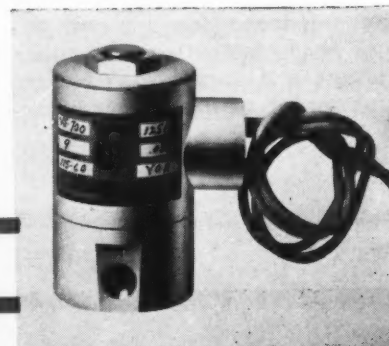
Another machine to be shown is an electronic-feed vertical drilling machine with automatic hydraulic cycling system. Feed rate is variable over a large range. Dwell operations and several different rates of speed are also available.

The Model No. 0 crank-action type keyseater (Fig. 1) is capable of cutting keyways in mild steel

up to 9 inches long by 1 inch wide at a feed of 0.005 inch. The Model No. 7 1/2 AA-14 self-contained hydraulic feed unit (Fig. 2) is adapted for vertical, horizontal, or angular mounting on flat ways. The unit is provided with automatic cycling, the standard cycle consisting of rapid traverse forward, feed, and rapid traverse return. It can be furnished with single or multiple spindles, positive stop, and delayed reverse.

Also to be displayed are a Model No. 3 contour grinder; a Model 17-HO vertical hydraulic-feed drilling machine; and a Model 60 HO-4 heavy-duty vertical hydraulic boring machine.

**Fig. 2. (Right) Small Size Solenoid Valve Made by the Skinner Chuck Co.**



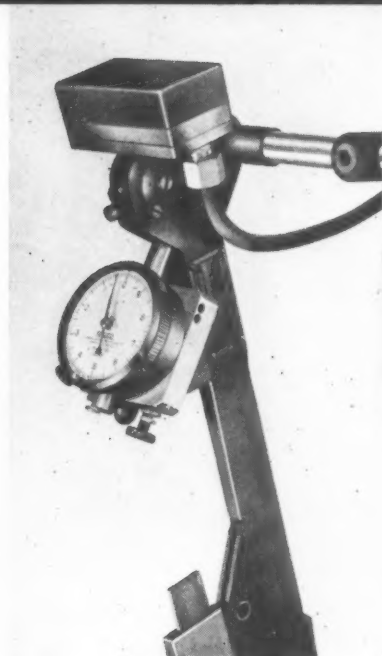
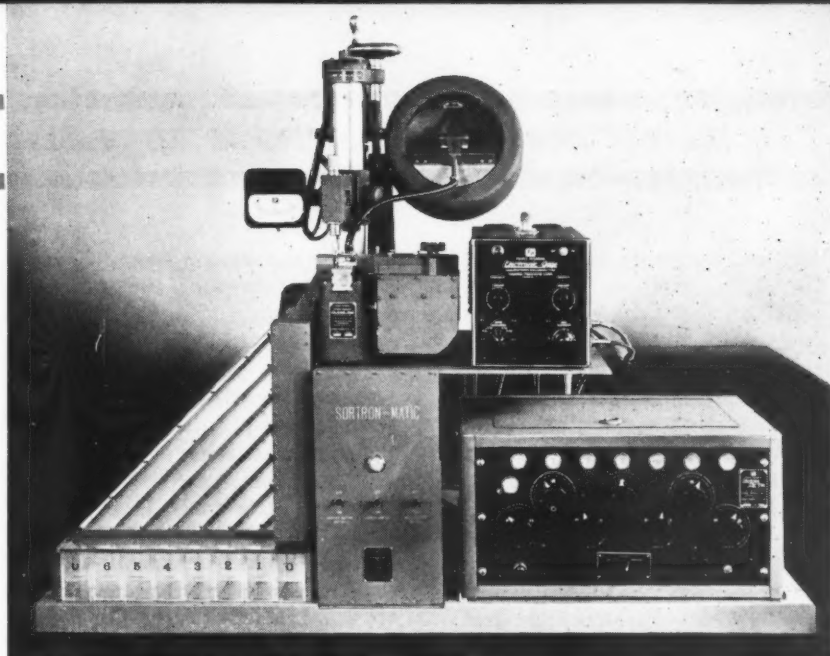


Fig. 1. (Left) Federal Automatic Gage that Classifies Balls or Rollers for Precision Bearings into Eight Categories. Fig. 2. (Right) A Combination of Federal Electricator and Arnold Grinding Gage Can be Used with Suitable Controls to Stop an Operation when the Work is Finished to Size

## Federal Automatic Gages

Booth 47

For the rapid inspection of precision parts, the Federal Products Corporation, 1144 Eddy St., Providence 1, R. I., has developed a line of automatic electronic gages that will be on display at the Show. This type of gage is adapted for the inspection of a wide variety of products. One unit gages the diameter, throughout the length, of piston-pins, and automatically sorts the pins into three categories—over size, under size, and within limits. Another gage classifies fountain pen barrels into four categories of diameter and rejects barrels that are over or under size in length. Still a third gage sorts balls and rollers for

anti-friction bearings into eight bins, as shown in Fig. 1. Inspection is at the rate of 90 to 100 pieces per minute in increments as small as twenty millionths of an inch.

Similar electronic principles have been applied in the Federal Electricator to control size directly on a machine. By this method, the machine can be controlled so that the operation stops when the work is finished to size. In Fig. 2, the Electricator is shown built into an Arnold grinding gage, which can be mounted on any cylindrical grinder. Many other Federal improved air and indicating gages will be exhibited.

## Westinghouse High-Temperature Motor

Booth 451

A silicone-insulated motor that weighs only 60 per cent as much as an electric motor of conven-

tional design and that has correspondingly smaller dimensions will be exhibited by the Westinghouse

Electric Corporation, Pittsburgh 30, Pa. This type of insulation, in addition to the use of silicone grease for bearing lubrication, makes possible a totally enclosed, non-ventilated motor in the 3- and 5-H.P., four-pole rating with the same frame sizes as the open motor of the same rating. This permits reductions of as much as three frame sizes from present standard Class A insulated motors. The efficiency, power factor, and torque of such a motor are comparable to those for an open motor of the same rating.

Fig. 1 illustrates the size reduction possible through the use of silicones. The motor on the left is a 5-H.P., 1750 R.P.M., four-pole, silicone-insulated motor in a No. 254 frame; the one on the right has the same rating, but is Class A insulated and is in a No. 326 frame. The weight, by using silicone, is reduced from 250 pounds to 145 pounds. The height is reduced 3 1/4 inches and the length 7 1/4 inches.

Another new unit—a "Life-Line" gear-motor having a rolled

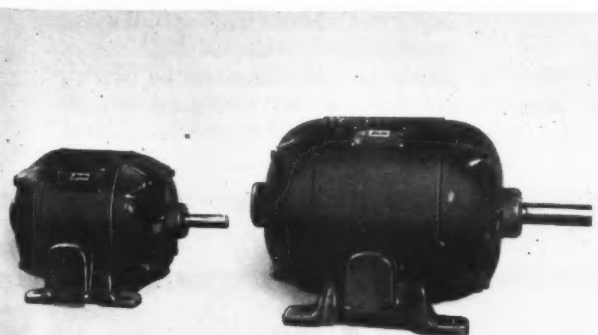


Fig. 1. (Left) Westinghouse Silicone-insulated Motor and Conventional Motor. Fig. 2. (Right) "Life-Line" Gear-motor



September, 1947—246-C



Fig. 1. Improved Wilson Rockwell Hardness Tester

steel frame— will also be shown. A single reduction unit accommodating a maximum gear ratio of 6.25 to 1, and two double reduction types for maximum gear ratios of 25.7 to 1 and 58.3 to 1, respectively, are available.

This combination of unit types and motors makes these drives available over a 1- to 15-H.P. range, with output speeds of 780 to 16.5 R.P.M. They are supplied with "Life-Line" alternating-current motors in open protected, splash-proof, and totally enclosed construction, and in all regularly used voltages and frequencies.

### Wilson Hardness Testers

Booth 452

The Wilson Mechanical Instrument Co., Inc., 230-D Park Ave., New York 17, N. Y., will have in operation improved models of the



Fig. 2. Wilson Tukon Tester for Determining Micro- and Macro-hardness Numbers

Rockwell hardness tester shown in Fig. 1, as well as a redesigned model of the Rockwell superficial hardness tester. Many improvements have been incorporated in these models, including stainless-steel elevating screws, conveniently located controls, and improved finish. Also in operation will be the Tukon tester, illustrated in Fig. 2, for determination of the Knoop hardness number, as well as the 136-degree diamond hardness number (Vickers type test). Another model is a micro-hardness tester, which makes possible hardness testing using extremely shallow indentations, and which is used for testing the quality of minute tools and parts; it can also be used for testing thin metal, shallow superficially hardened surfaces, fine wire, and certain individual crystals or particles of microscopic size.

### Armstrong-Blum Sawing Machines

Booth 550

A new "Marvel" hydraulic band-sawing machine will be demonstrated by the Armstrong-Blum Mfg. Co., 5700 Bloomingdale Ave., Chicago 39, Ill. This No. 15 machine incorporates a new development in saw blades—a high-speed steel endless band saw blade 1 1/2 inches wide by 0.072 inch thick, with widely spaced teeth. It has a capacity for cutting off solid bars of even the toughest steels up to 15-inch square solids at a high rate of production.

The machine has full hydraulic direct drive, feed, work clamping, and end-gage retraction. It is equipped with a new fully automatic bar feed or work push-up that provides fast travel for long lengths with automatic slow-down as the work approaches the end

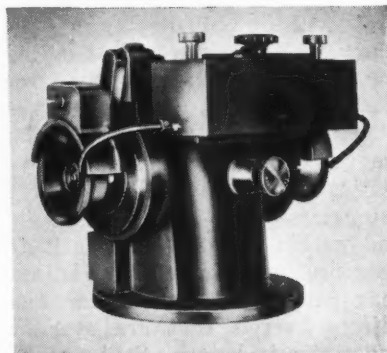
gage or measuring stop. A newly developed torque control valve automatically adjusts the feed pressure to maintain a constant pulling load on the blade.

Also to be exhibited is a No. 18 "Marvel" hydraulic "Roll-Stroke" hacksaw machine equipped with a new power-driven, work-handling table for extremely long lengths of material. The table provides accurate measurement of any desired length of work to be cut off, with provision to run the cut-off work beyond the measuring end gage to facilitate straight-line handling of work.

### Improved Spindle Assemblies for Covel Grinders

Booth 636

New type spindle assemblies, designed especially for use with diamond wheels in grinding car-



Covel Spindle Assembly for Diamond Grinding of Carbide Tools on Cutter Grinders

bide cutters on the Nos. 12 and 22 universal cutter and tool grinders, built by the Covel Mfg. Co., Benton Harbor, Mich., will be seen at the Show. The cartridge type, spring-loaded, precision ball-bearing, "sealed-for-life" spindle has reversible rotation, so that rough and finish grinding can be accomplished without changing wheels or disturbing the set-up. Coarse

## AT THE MACHINE TOOL SHOW

and fine wheels are mounted at the two ends of the spindle, and the head can be swiveled 180 degrees to bring either wheel into the working position. The rotational direction of the spindle is controlled by a push-button. A tank mounted on the head provides a constant flow of lubricant to the wheels.

The Covel No. 15 and No. 20 surface grinders to be demonstrated are provided with hard chrome table ways and "sealed-for-life" ball-bearing spindles.

### *Reliance Squirrel-Cage Motors*

**Booth 302-C**

A line of squirrel-cage alternating-current motors that can be used for machine tool drives of all types will be displayed by the Reliance Electric & Engineering



*Reliance "Precisioneered" Squirrel-cage Alternating-current Motor*

Co., 1077 Ivanhoe Road, Cleveland 10, Ohio. These motors, which range in capacity from 1 to 200 H.P., are available in foot-mounted, end-mounted, and flange-mounted types, and in totally enclosed or fan-cooled designs. Features of the new line include all-steel frames, welded cores, aluminum pressure-cast rotors, the Reliance precision bearing

### *Haskins New Flexible-shaft, High-speed Grinder which can be Used in either a Vertical or a Horizontal Position*

mounting, and special insulation.

Also to be featured by this company is the V\*S Drive System, a packaged all-electric drive for alternating-current circuits that provides a number of essential control functions to increase operating flexibility and simplify control of lathes, boring mills, and other types of machine tools. These drives provide stepless speed changes over an infinite operating range; controlled acceleration and deceleration; and slow speeds for jogging, "creeping," and threading. All functions can be controlled either electrically or electronically.



### *Haskins Flexible-Shaft Grinder*

**Booth 675**

A flexible-shaft high-speed grinder for light hand grinding, finishing, trimming, and polishing will be shown in operation by the R. G. Haskins Co., 2643 W. Harrison St., Chicago 12, Ill. The new grinder is available in either pedestal or bench types. It is equipped with a 1/4-H.P. high-torque motor that delivers 18,000 R.P.M. (free speed), and operates on 115-volt alternating or direct current.

### *Fafnir "Plya-Seal" Bearings*

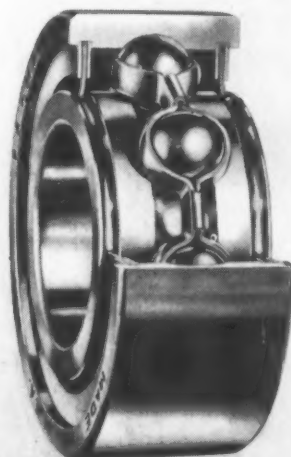
**Booth 438**

An addition to the line of "Plya-Seal" bearings will be displayed by the Fafnir Bearing Co., New Britain, Conn. These new series bearings—designated W-PP—are the same width as the standard double-row ball bearing, but have only a single row of balls. "Plya-Seals" are provided on both sides for the retention of lubricant and the exclusion of foreign material.

The principal advantage of this bearing is the fact that it is a self-contained, anti-friction unit carrying a large sealed-in supply of grease that is ample for years of operation. Use of a single row of balls in a double-row width provides space for a long-time supply of grease without total filling, thus permitting "breathing," grease expansion due to aeration, and agitation under high speeds without leakage. The double width

insures better shaft and housing support without slippage; the wide inner-ring face provides "pull-off" face area over standard shaft shoulder diameters. The W-PP bearings are being produced in bore sizes from 20 to 70 millimeters.

### *New Prelubricated Bearing to be Exhibited by the Fafnir Bearing Co.*





**Cushman Air-operated Chuck with "Accralock" Positive Jaw Adjustment**

### **Cushman Air Chucks, Cylinders, and Controls**

**Booth 271**

The Cushman Chuck Co., Hartford 2, Conn., will exhibit a complete new line of air-operated power chucks, air cylinders, and control equipment. The air-operated power chucks will include serrated adjustable-jaw, screw adjustable-jaw, and manufacturing and compensating jaw styles. Also, two-jaw gib type and round-body chucks and collet chucks will be exhibited. The serrated adjustable-jaw chucks, such as the one illustrated, will feature the new "Accralock" positive precision jaw adjustment. Wrench-operated chucks and collet chucks for lathe spindle noses will also be shown.

### **Holo-Krome Socket Cap-Screws**

**Booth 33-D**

A line of flat-head socket cap-screws that are cold-forged from special alloy steel will be exhibited by the Holo-Krome Screw Corpo-



ration, Hartford 10, Conn. The forging process, which is used to form all portions of the screw with the exception of the threads,

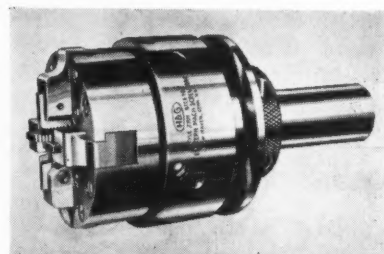
is said to insure high strength and maximum accuracy. Other Holo-Krome products will also be exhibited.

### **Eastern Machine Screw Corporation Will Show New Line of Die-Heads**

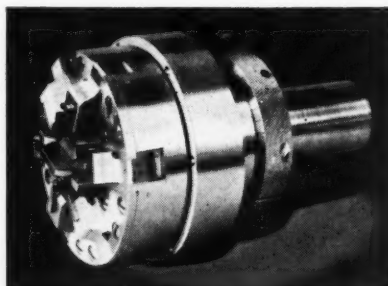
**Booth 160**

A line of special die-heads for cutting taper pipe threads to accommodate 1/16- to 2-inch pipe, will be featured by the Eastern Machine Screw Corporation, New Haven 6, Conn. These revolving, self-opening die-heads have a self-contained cam that controls the exact taper wanted.

In addition to producing pipe threads that are correct for taper and fit, these heads eliminate chaser marks usually left along



**Fig. 2. Self-opening, Pipe-thread Die-head for Use on Automatic Screw Machines**

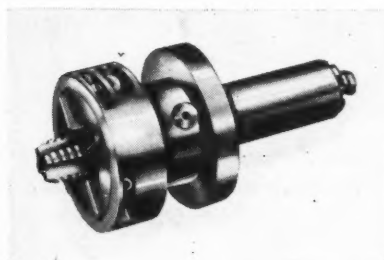


**Fig. 1. Eastern Die-head for Use on Pipe-threading Machines and Turret Lathes**

the thread when a jam cut is made by an ordinary self-opening die-head. In the TM style (Fig. 1), provision is made for the installation of a tool for reaming and chamfering the pipe end at the same time the threads are being cut. Style TM die-heads are for use on pipe-threading machines and turret lathes, while the TMM head (Fig. 2) is for use on multiple-spindle automatic screw ma-

chines. A third model—the DMT head—was developed for use with Brown & Sharpe automatic screw machines.

The H & G solid adjustable die-head with compensating tap-holder, shown in Fig. 3, permits tapping an internal thread and, at the same time, cutting an external thread of different pitch. Tool space as well as a cam lay-



**Fig. 3. H & G Solid Adjustable Die-head with a Compensating Tap-holder**

out is saved, thus resulting in an increase in production. The same insert chasers that are used in other H & G opening heads will fit this die-head.

**Flat-head Socket Cap-screw Made by Holo-Krome Screw Corporation**

## Marlin-Rockwell "Synthe-Seal" Bearings

Booth 156

Seals made of soft, synthetic rubber with a steel core for strength are features of the "Synthe-Seal" line of ball bearings to be placed on display by the Marlin-Rockwell Corporation, Jamestown, N. Y. These bearings are made in standard SAE single-row bores, outside diameters, and widths, and are provided with seals on one or both sides.

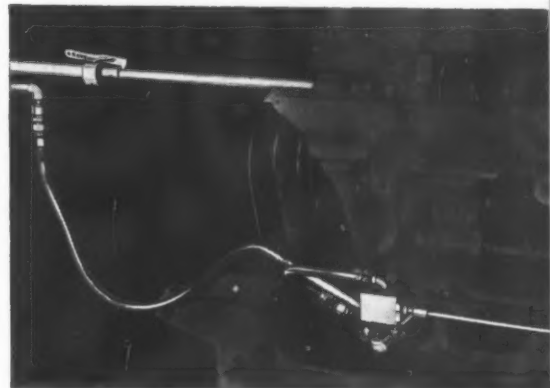
The synthetic rubber wiping lip of the seal contacts a ground



*Cutaway View of the Marlin-Rockwell Ball Bearing with Synthetic Rubber Seals*

curved surface on the inner race of the bearing, as shown, thus retaining the lubricant in the bearing and excluding dirt or grit. The seal can be removed or replaced in a few seconds without special tools. The synthetic rubber used for the seals is not affected by water, oil, grease, or solvents, and remains pliable throughout its long life. The seals are satisfactory for bearing operations at temperatures varying from 225 degrees F. to minus 30 degrees F.

*Coolant under Pressure from the Machine Pump is Used for Feeding the Work in This Hy-Level Bar-feed Attachment*



## Hy-Level Liquid Pressure Bar-Feed Attachment

Booth 328-C

An attachment to eliminate feed-tubes, feed-fingers, silencers, extended pusher-rods and other extra equipment, has been developed by the Hy-Level Screw Products Co., 2114 W. Superior Ave., Cleveland 13, Ohio. The valve and packless piston design of this attachment makes possible the use of a pump and coolant in the machine. Uniform pressure is applied only during the feed cycle.

The bar being fed is automatically lined up and enters the collet freely. Bar end lengths up to about 1 1/8 inches can be held. No bar ends remain in the spindle. Bars up to 3/32 inch over the regular machine capacity size can be handled. The new bar-feed attachment is designed for use on Brown & Sharpe automatic screw machines and on single-spindle Cleveland automatics.

## Carboloy to Show New Line of Carbide Boring-Bars

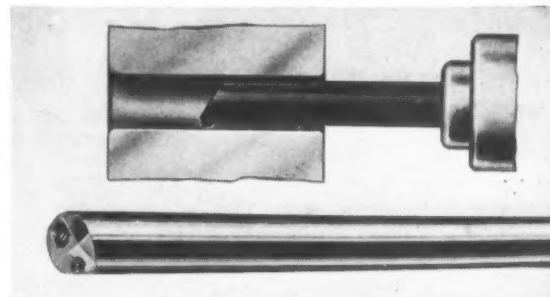
Booth 655

Boring-bars made of solid Carboloy cemented carbide, making possible the precision boring of holes having a length to diameter ratio as high as 8 to 1, are to be shown at the exhibit of the Carboloy Company, Inc., Detroit 32,

Mich. The greater stiffness inherent in the carbide metal keeps these tools from backing away from the work and also from "winding up" in the hole.

Two types are available—a solid carbide bar with a carbide boring

*(Upper View) Carbide Boring-bar with Brazed Tool. (Lower View) Carbide Boring-bar with Steel Insert in One End*



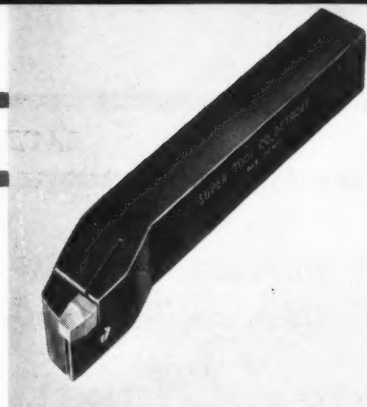
## LATEST EQUIPMENT TO BE SEEN AT THE SHOW

tool brazed into a recess in one end of the bar (shown in the upper view of the illustration); and a solid carbide bar carrying a steel insert at one end of the bar in which the carbide boring tool is held and adjusted by means of set-screws, as seen in the lower view.

The first type of bar is available in only one size, 3 1/2 inches long and 0.218 inch in diameter. The tool can be furnished in various grades and is suitable for boring holes from 1/4 to 3/8 inch

diameter. The other type bar, with steel insert, is available in seven sizes. Range of boring diameter varies from 1/4 up to 1 inch, in increments of 1/8 inch.

Solid Carbide boring tools for use with the steel-insert boring-bar are furnished finish-ground and ready to use in grades suitable for both steel cutting and for the boring of cast iron and other materials. These tools range in size from 0.0932 inch diameter by 9/32 inch long to 0.1870 inch diameter by 1 inch long.



*One of a New Line of Offset Tool-holders Developed by Super Tool Co.*

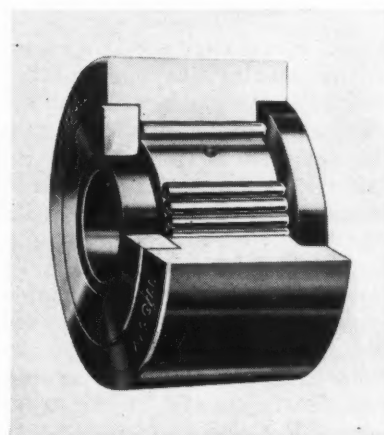
### *Offset Holders for Carbide Tools*

**Booth 676**

A complete line of offset ejector tool-holders, added to the company's line of straight ejector tool-holders, will be featured by the Super Tool Co., 21650 Hoover Road, Detroit 13, Mich. These new tools have all the advantages of the straight type holder plus the ability to handle facing and boring operations that are difficult to reach with the latter type.

They are designed to hold an insert of solid carbide without clamping strains, and allow the chips freedom from interference with the clamping mechanism. The angle at which the carbide insert is held gives maximum economy in regrinding and prevents the wheel from coming in contact with the steel holder.

*Cam-yoke Roller Bearings Made by McGill Mfg. Co.*



### *Twin Disc Hydraulic Coupling*

**Booth 453**

The Twin Disc Clutch Co., Rockford, Ill., will feature small hydraulic, twin-disc couplings for use with electric motors from 1 to 25 H.P. in its display at the Machine Tool Show. These units, which range in size from 7.4 to 12.2 inches in diameter, supplementing the larger coupling made by the company, insure smooth acceleration, prevent stalling, and eliminate the need for protective devices between the motor and the load.

Another product to be exhibited is the Model P air-actuated clutch. This clutch is especially suited for

heavy type machinery, such as punch presses, brake presses, and forging machines, as well as for applications where remote control and ease of operation are desired. An outstanding feature of the clutch is its freedom from the necessity of adjustment. Sizes range from 14 to 42 inches in one, two, and three-plate construction, and working capacities from 75 to 1325 H.P.

### *McGill Cam-Yoke Roller Bearings*

**Booth 549**

A complete line of cam-yoke roller bearings will be featured by the McGill Mfg. Co., Inc., 400 N. Lafayette St., Valparaiso, Ind. Added to the company's "Multi-rol" cam follower line, these bearings were designed to increase the adaptability of cam-follower applications where mounting of the roller unit on a shaft is desirable. Bore diameters range from 0.250 to 1.25 inch. These bearings are equipped with small-diameter, rounded-end rollers. Sturdy end plates are permanently secured to inner ring shoulders to retain the rollers in the manner indicated in the accompanying illustration.



*Cutaway View of the New Twin Disc Hydraulic Clutch*

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## *A Preview of Some of the Additional Exhibits*

**I**N addition to the new or improved machines illustrated and described in the preceding pages, there will be many other interesting exhibits at the Machine Tool Show, a few of which are briefly described in the following:

Abrasive Machine Tool Co., Inc., East Providence 14, R. I. (Booth 126) will exhibit an 8- by 24- by 12-inch surface grinder equipped with tool-steel ways, electronic control for variable wheel and table speeds, and automatic lubrication which will stop the motor if the oil pressure drops. Also to be exhibited are a carbide-die grinder and a circular graduating machine for calibrating hand-wheels and dials.

Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32, Ill. (Booth 673) will feature a moving display showing how internal self-aligning ball bearings compensate for misalignment of shafts. Ball and roller bearings and pillow blocks will also be displayed.

Allegheny Ludlum Steel Corporation, Pittsburgh, Pa. (Booth 645) will display carbides, and tool, stainless, and electrical steels. Carbide die sections will actually be designed at the Show.

Louis Allis Co., Milwaukee 7, Wis. (Booth 143) will exhibit its

"Ajusto-Spede" variable-speed motor drive for machines and other shop equipment requiring a constant torque input.

American Broach & Machine Co., Division of Sundstrand Machine Tool Co., Ann Arbor, Mich. (Booth 22) will demonstrate several broaching machines and a complete line of broaches and pull-heads.

Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 4, Wis. (Booth 328T) will exhibit sand and centrifugal castings, extruded rod and tubes, continuous cast alloys, and resistance and arc welding electrodes.

Axelson Mfg. Co., 6160 S. Boyle Ave., Los Angeles 11, Calif. (Booth 232) will have on display 16-, 20-, and 25-inch heavy-duty engine lathes featuring two-speed tailstocks for heavy drilling, built-in reverse disk clutches, and hydraulic disk brakes.

W. F. & John Barnes Co., 301 S. Water St., Rockford, Ill. (Booth 129) will demonstrate the company's standard self-contained hydraulic drilling units.

Bunting Brass & Bronze Co., Toledo 9, Ohio (Booth 317B) will feature a variety of cast-bronze bearings, equipment illustrating

the use of sleeve bearings, and metallic ores from which bearing bronzes are made.

Carborundum Co., Niagara Falls, N. Y. (Booth 36) will exhibit the new Series 20 grinding wheels described on pages 156 and 157 of August MACHINERY.

Chicago Drillet Corporation, 1729 N. Winchester Ave., Chicago 22, Ill. (Booth 649) will display their drill press turret heads and universal box jigs.

DoAll Co., 254 N. Laurel Ave., Des Plaines, Ill. (Booth 37) will exhibit cutting tools, band saws, files, cutting oils, lubricants, and machine tool accessories. This company will also have an exhibit at Booth 100 of the Production and Machine Tool Show, International Amphitheater, Chicago, and at the company's plant in Des Plaines.

General Machinery Corporation, Niles Tool Works Division, Hamilton, Ohio (Booth 110) will feature models of the line of heavy machinery made by the company, and animated descriptions of their products and facilities.

Hardinge Brothers, Inc., Elmira, N. Y. (Booth 45) will demonstrate their complete line of machine tools and accessories, including multi-operation chucking ma-

chines, high-speed second-operation machines, lathes, milling machines, collets, chucks, feed-fingers, fixtures, and tools.

Hyatt Bearings Division, General Motors Corporation, Harrison, N. J. (Booth 433) will display the "Hy-Load" line of cylindrical roller bearings, and will show specific examples of bearing applications.

Hydro-Power, Inc., Springfield, Ohio (Booth 625) will feature a newly designed line of reversible hydraulic gear pumps.

Ideal Industries, Inc., 1011 Park Ave., Sycamore, Ill. (Booth 448) will demonstrate a new electric "Thermo-Grip" soldering kit, a redesigned electric cleaner of the air-blower type, and a heavy-duty live center.

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago 6, Ill. (Booth 404) will exhibit the new Thor impact wrenches, and pneumatic and electric tools.

Charles L. Jarvis Co., Middletown, Conn. (Booth 313C) will feature a line of high-speed, custom-finished taps and dies known as the Jarvis-Dowding tools, and the "Torqomatic" torque-driven tapper.

Kennametal, Inc., Latrobe, Pa. (Booth 570) will show a line of tools having a cylinder of Kennametal mechanically clamped in a steel holder; single-point tools with both clamped and brazed carbide tips; milling cutters; roll-turning tools; solid carbide boring tools; carbide balls for check-valves, hole sizing and hardness testing; carbide rolls for metal finishing; and wear-resistant parts.

Logansport Machine Co., Inc., Logansport, Ind. (Booth 113) will display its redesigned line of air control valves described in the Shop Equipment News Section of June MACHINERY.

Lovejoy Tool Co., Inc., Springfield, Vt. (Booth 153) will exhibit its line of face milling cutters with positive-locking interchangeable blades, "Cutsall" carbide-tipped milling cutters, and other tools.

New Departure Division, General Motors Corporation, Bristol, Conn. (Booth 604) will feature examples of various types of ball bearings used in many new machine tools.

Norma-Hoffmann Bearings Corporation, Stamford, Conn. (Booth 313A) will exhibit a line of ball, roller, thrust, and totally sealed cartridge bearings.

Oakite Products, Inc., 18 Thames St., New York 6, N. Y. (Booth 317G) will exhibit soluble oils for coolants, additives for cutting emulsions, "Bactericide" for sterilization, and rust preventive oils.

Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio (Booth 302D), will demonstrate the laying out and servicing of flexible-tube systems, and display tubing system components, including valves and fittings.

Plan-O-Mill Corporation, 1511 E. Eight-Mile Road, Hazel Park, Mich. (Booth 408) will show the company's standard No. 1 planetary thread and form milling machine, auxiliary equipment, tools, and parts produced on this machine.

Parker-Kalon Corporation, 202 Varick St., New York 14, N. Y. (Booth 243A) will exhibit a giant model of a socket-head cap-screw and a set-screw.

Pioneer Pump & Mfg. Co., 19643 John R St., Detroit 3, Mich. (Booth 35F) will display several styles of Pioneer and Rollway pumps.

Precise Products Co., 1328-30 Clark St., Racine, Wis. (Booth 37C) will demonstrate portable electric hand tools, carbide milling cutters, flexible-shaft attachments, a "Vari-speed" lathe, commutator under-cutter, and a wire stripper.

Roller Bearing Co. of America, Trenton 3, N. J. (Booth 13B) will exhibit a series of roller followers for machine tools, internal combustion engines and numerous other applications.

Ross Operating Valve Co., 6455 Epworth Blvd., Detroit 10, Mich.

(Booth 313B) will exhibit a new small-size poppet type air-control valve for either hand-lever or foot-treadle operation.

S K F Industries, Inc., Front St. and Erie Ave., Philadelphia 32, Pa. (Booth 666) will feature cut-away models of anti-friction bearings, bearing mountings, and an oil-mist lubricator for spindle bearings.

Staples Tool Co., Cincinnati 25, Ohio (Booth 47F) will display single-point and circular carbide tools, including turning, boring, facing and roller turner tools, milling cutters, and form tools. An expansion reamer will also be shown.

Synthane Corporation, Oaks, Pa. (Booth 34B) will exhibit hundreds of laminated and molded-laminated parts.

Taft-Peirce Mfg. Co., Woonsocket, R. I. (Booth 601) will demonstrate the "Compairator" air gage, surface grinders, chucks, gages, and inspection equipment.

Timken Roller Bearing Co., Canton 6, Ohio (Booth 317D) will feature a new type of graphitic steel for lathe ways, and a complete line of bearings.

Union Mfg. Co., 300 Church St., New Britain, Conn. (Booth 125) will display manually operated chucks and chain hoists, electrically operated chucks and wrenches, and air-operated self-centering chucks.

Veeder-Root, Inc., Hartford 2, Conn. (Booth 402) will exhibit the company's complete line of mechanical and electrical counting devices.

Warner Electric Brake Mfg. Co., Beloit, Wis. (Booth 328A) will show a line of electric brakes and clutches that provide instantaneous operation and infinite control.

Weddell Tools, Inc., 37 Centennial St., Rochester 11, N. Y. (Booth 483) will exhibit "Super" carbide-tipped "Tri-Bit" face mills.

SEE THE

*LATEST  
DEVELOPMENTS*

BOOTH

505

MACHINE TOOL SHOW  
Dodge-Chicago Plant  
SEPT. 17-26

BROWN & SHARPE MFG. CO.

**SMALL TOOLS**

Machinists' Tools  
Testing and Gaging  
Equipment  
Cutters and Hobs  
Arbors, Collets and  
Adapters  
Screw Machine Tools  
Permanent Magnet  
Chucks  
Vises  
Pumps  
Other Useful Shop  
Equipment

BROWN &

# IN MACHINES and TOOLS

## MACHINE TOOLS

### ★ MILLING MACHINES

Universal  
Plain (including  
Manufacturing Type)  
Vertical

### ★ GRINDING MACHINES

Universal  
Plain  
Surface  
Cutter  
Tool

### ★ SCREW MACHINES

Automatic (including  
Screw Threading and  
Cutting-Off Type)  
Wire Feed

NEW DEVELOPMENTS for increased efficiency in manufacturing and toolroom operations will be shown *for the first time* at Booth 505. Come, see new ideas for improving productivity per man and machine. Get "first-hand" answers to your questions. Other well-known, time-tested Brown & Sharpe Machines, Attachments and Small Tools will be displayed also . . . a good opportunity to examine and compare all their features. You are cordially invited. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

# SHARPE



## Automatic Brazing Machine

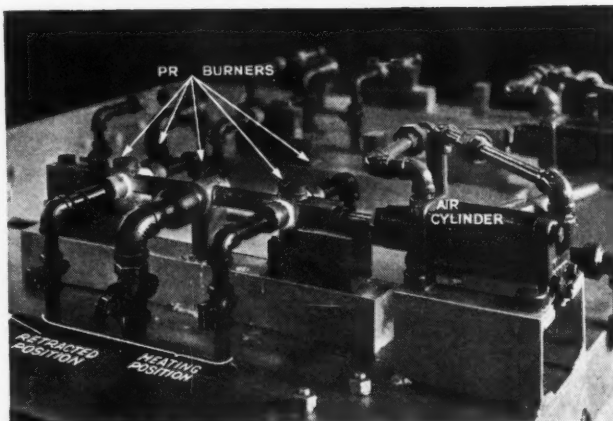
Stronger and more uniform joints are being obtained by automatic control of the heating pattern, heat timing, fuel supply, and assembly pressure in a new brazing machine developed by the Selas Corporation of America, Philadelphia 34, Pa. This machine, which was designed specifically for brazing a brass sink fixture, completed the operation in thirty seconds. Three stations like the one shown in the accompanying illustration are provided for operating in a loading, heating, and cooling sequence.

The five component parts, on which alloy rings are placed, are given an application of flux and positioned in a supporting jig. Air pressure is then applied to assure close contact of all parts during the heating and cooling cycles. As the burners are brought to the brazing position a solenoid valve opens the gas-air mixture line to the "full on" position. A timer releases the burners at the end of the heating cycle, retracting them and cutting the fuel supply to the minimum required to maintain a pilot flame.

\* \* \*

## New Industrial Motion Pictures

"Watts in Glass," a technicolor sound motion picture that portrays the role of Fiberglas insulation in electrical equipment of many types, has recently been announced by the Owens-Corning Fiberglas Corporation, Toledo 1, Ohio. One of the advantages of this type of insulation to machine tool manufacturers is the space and weight savings obtainable in motors and the dependable performance of such motors under severe operating conditions. The motion picture points out that the Warner & Swasey Co., for example, has adopted Fiberglas-insulated driving motors for its new line of Electro-cycle turret lathes. These motors are of special design, having radial vent slots in the rotor and stator and a hollow rotor car-



One of the Three Stations of an Automatic Brazing Machine

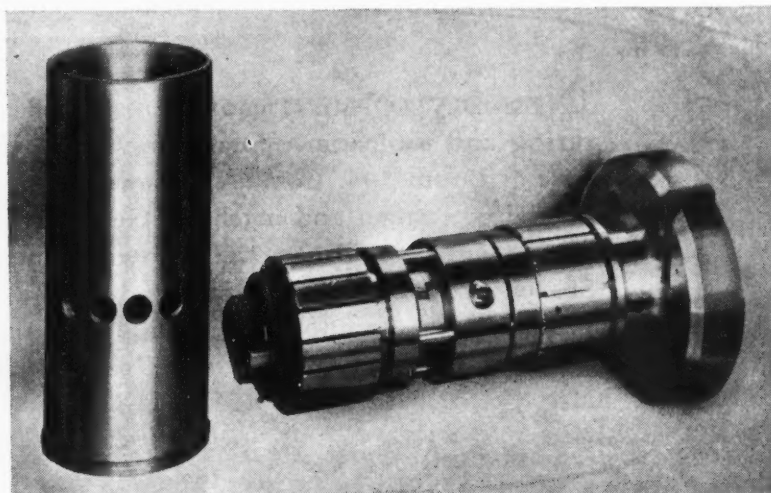
ried on a magnesium spider to dissipate heat.

A moving picture entitled "Golden Horizons" has been made by Ampco Metal, Inc., Milwaukee 4, Wis., which depicts the history and development of the copper-base alloys from prehistoric days up to the present time. This is a 16-millimeter, thirty-three-minute film in sound and color. Technical societies and industrial concerns that would like to show the film can obtain bookings by writing Ampco Metal, Inc.

\* \* \*

## Expanding Mandrel Used in Grinding Cylinder Liners

In grinding cylinder liners for Diesel engines, it was found necessary to locate the work laterally from port-holes instead of from the conventional rings or pins.



Diesel-engine Cylinder Liner and Expanding Mandrel on which it is Held for Grinding

This presented a rather difficult problem, which was finally solved satisfactorily by using a dual-sleeve expanding mandrel made by Erickson Tools Division, Cleveland, Ohio, to hold the liner. A spur gear shaft and two racks inside the mandrel actuated the liner locator from the faceplate.

The same rigid holding mandrel, when used for another job, made possible a reduction in rejections of from 1800 pieces out of 2400 to less than 1 per cent.

\* \* \*

## Ford Training Program

The Ford Motor Co. is offering college graduates between the ages of twenty and twenty-six an opportunity to be trained for work in various divisions of the company, including manufacturing, sales and advertising, purchasing, engineering, finance, industrial relations, and public relations. A certain number of applicants will be selected on the basis of scholarship, leadership, enterprise, and personality for the training course, which extends for a period of two years, after which they will be assigned to positions of responsibility in the organization. Further information about the program can be obtained by writing to the Director, Salaried Personnel Department, Ford Motor Co., Dearborn, Mich.



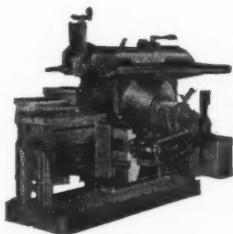
# Shape-Form-Shear

...ON A "CINCINNATI"

Today Cincinnati Shapers are more efficient than ever before with heavier cutting capacities and speeds up to 200 strokes a minute on the 16"; and with a degree of *accuracy* that has never been excelled. Their power rapid traverse; multiple cam feeds; direct reading dials; and automatic oiling sell discriminating buyers. Coupled with these mechanical features are convenient controls; simplified adjustments; and means for quick and easy set-up, all of which please the operator.

Cincinnati Shapers are built in regular or universal type from 16" to 36". Ask for Cat. N-3.

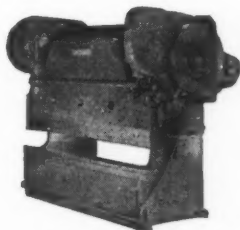
*See these machines under power at the Show*



Cincinnati Press Brakes, the brakes of many uses, are today's machines for bending, forming, flanging, or multiple punching sheet metal. For easy fabrication, formed parts must fit; therefore *accuracy* is a fundamental advantage of these Brakes. Full-rated capacities; all-steel construction; built to withstand overload; deep bed and ram to avoid deflection are a few of the high points. These Brakes are built as accurately as a machine tool, and have unusual mechanical refinements.

Sizes to cover practically any requirement. Ask for Cat. B-2

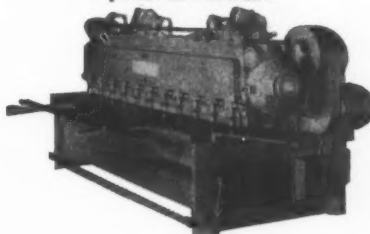
*See these machines under power at the Show*



Cincinnati All-Steel Shears offer a new degree of *accuracy* in shearing sheet metal. They cut to tolerances that take a micrometer to measure; and shear with this *accuracy* at high speed. They shear a wide variety of material in both ferrous and non-ferrous metals. Hydraulic holddowns automatically clamp any gauge of metal with the same firm pressure; fine adjustments for the four-edge knives give more efficient use of the keen edge and longer life. Rapid, accurate gauging speeds up handling of the job.

Standard capacities of Shears range from 10 gauge to 1 1/4 inches. Ask for Cat. S-4.

*See these machines under power at the Show*



**THE CINCINNATI SHAPER CO.**

CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES

See these machines in action  
at the

**Machine Tool Show**

Chicago, Sept. 17-26.

Booth No. 417

# Shop Equipment News

*Machine Tools, Unit Mechanisms, Machine Parts, and Material-Handling Appliances Recently Placed on the Market*

## Moline Special Multi-Spindle Automatic Drilling Machine

A special twenty-nine-spindle automatic machine designed for drilling the holes in aluminum header plates of heat transfer equipment for aircraft has been built by the Moline Tool Co., 100 Twentieth St., Moline, Ill. This machine will drill ellipse-shaped plates in which the major axis of the drilled area is about 25 1/4 inches and the minor axis approximately 13 3/4 inches. In this area it will drill approximately 3700 holes of slightly less than 1/4 inch diameter. The holes are

drilled in rows with a center-to-center distance from one hole to the next of 1/4 inch.

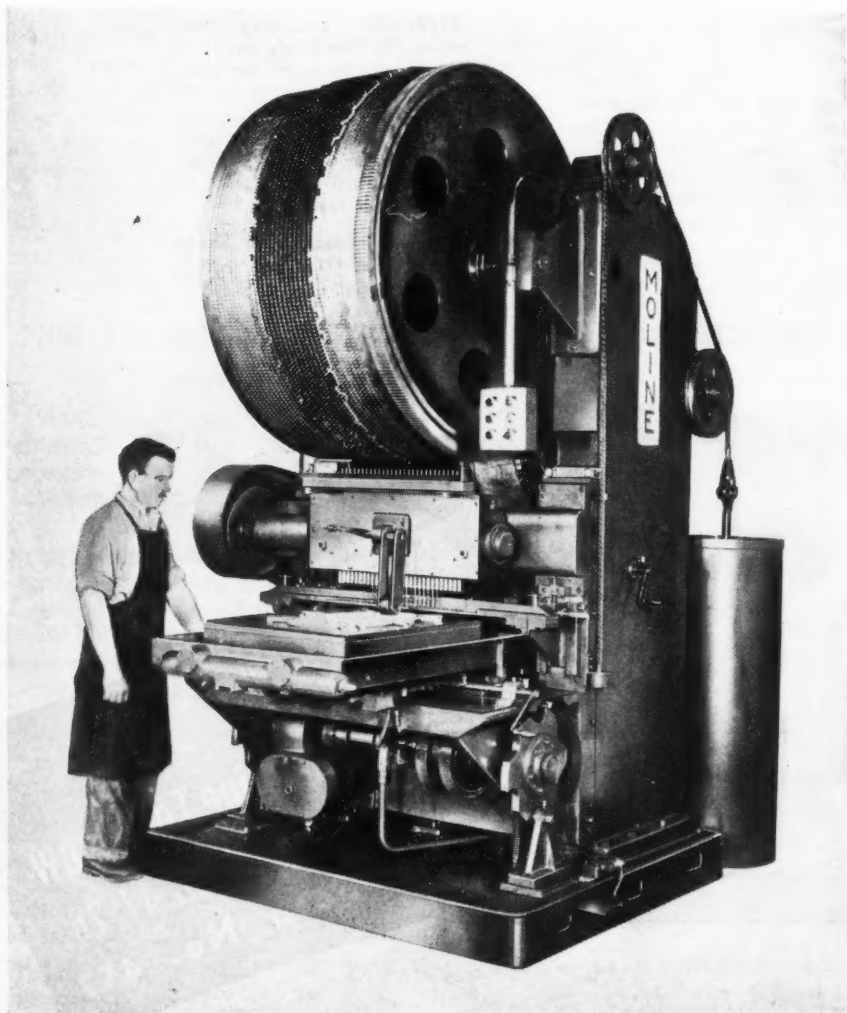
The rows of holes are spaced slightly less than 1/4 inch between center lines and with the rows staggered. The rows of holes are also spaced wider apart at certain intervals to provide room for the insertion of baffles. The plates are stacked in pairs, one pair being drilled during a complete operating cycle of the machine.

The drum type spindle-selector,

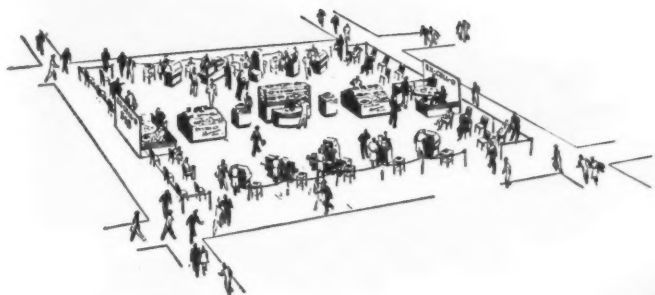
which can be set up for any hole pattern within the range of the machine, provides for drilling up to as many as 9657 holes in one operating cycle. This spindle selection mechanism is synchronized with the indexing movement of the work-table. The spacing of the spindles is such that every third hole in a row is drilled at one pass of the drills, the table being indexed sidewise twice to complete the drilling of each row of holes.

The spindle-selector drum has no motion either vertically or horizontally, but is indexed so that it turns on its horizontal axis after each pass of the drills. Each indexing motion brings a new row of holes in the spindle selector drum into position directly above the drill spindles. The work-table, carrying the pair of plates to be drilled, is moved up and down by cam action to produce rapid traverse and feed movements.

On the same slide with the table is mounted the rail which carries the drill spindles. Thus, when the table moves upward, the drills also move upward at the same rate. At the point where the feed begins and the upper ends of the spindles reach the drum, the upward motion ends for any spindle that comes in contact with a plug inserted in the hole in the spindle-selector drum located directly above that particular spindle. Consequently, as the table continues to feed the work upward the selected spindles will drill the required holes. After the drilling of a row of holes has been completed, the work-table moves at right

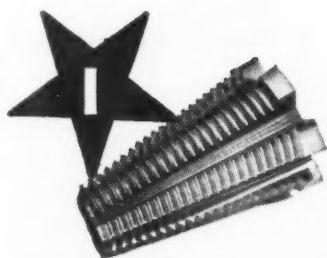


Special Twenty-nine Spindle Drilling Machine with Fixture and Operating-cycle Control, Built by Moline Tool Co. for Drilling Aluminum Header Plates of Aircraft Engine Oil-cooling Equipment



# 5 Star FEATURE

## of the MACHINE TOOL SHOW



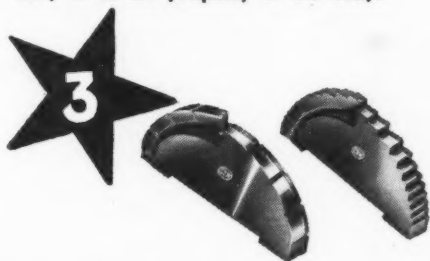
**CONTINENTAL THREAD  
MILLING CUTTER**

This special thread milling cutter was made by Continental for milling carbon electrodes.



**CONTINENTAL FACE  
MILLING CUTTER**

This standard cutter has blades placed either radially in the face of the cutter body or in the periphery of the body.



**CONTINENTAL CARBIDE-TIPPED  
CUTTERS**

Roughing and finishing doming cutters for aircraft cylinder heads.



Be sure to see Continental's display of standard and special cutting tools when you visit the Machine Tool Show at the Dodge-Chicago Plant, September 17 to 26. Continental Tool Works, a division of Ex-Cell-O Corporation, has been designing and manufacturing cutting tools for American industry for 28 years. Watch Continental's precision-made cutting tools in action on metal-working machines when you visit the Ex-Cell-O booth (No. 518) at the Chicago Show.



**CONTINENTAL  
PRECISION BROACH**

Involute Spline Broach. Continental makes all kinds of round, square, rectangular, spline and insert-type broaches.



**CONTINENTAL  
INTERCHANGEABLE  
COUNTERBORE**

Continental's famous counterbore with balanced indestructible drive. Toolroom counterbore sets—in three sizes (See them at the Show.)

47-27

**CONTINENTAL TOOL WORKS**  
DIVISION OF EX-CELL-O CORPORATION  
DETROIT 6, MICHIGAN

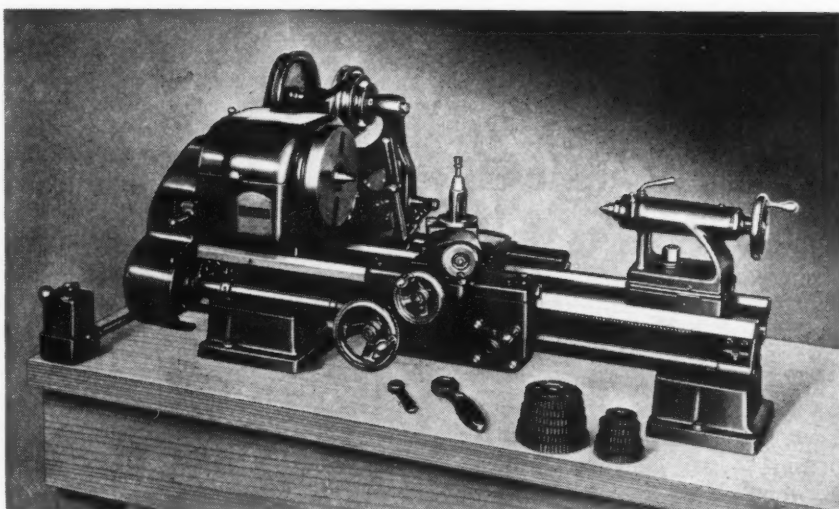
angles to the row of holes, in order to locate the work for drilling the succeeding row.

This cycle of operations is continued with the spindles being selected and the work indexed both sidewise and from one row of holes to the next until all the required holes have been drilled and the machine is automatically stopped. .... 51

### Logan Shop and Tool-room Lathe

The Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill., has added to its line of lathes a new 9-inch lathe incorporating the advanced design features of the larger lathes in the line. This lathe will take work 18 inches long between centers. It is built for precision manufacturing and general machine shop and tool-room work, and is adapted for automobile and appliance repair shop work. Its compact size also makes it well adapted for use in home work-shops.

Like the larger lathes of the Logan line, this machine has a



Logan Shop and Tool-room Lathe

ball-bearing spindle mounting adapted to high-speed operation. The two V-ways and two flat ways of the bed are precision ground parallel within accuracy limits of 0.0005 inch. Massive construction is employed to insure durability and steadiness on heavy cuts. Self-lubricating bronze bearings are used to resist wear at vital points. .... 52

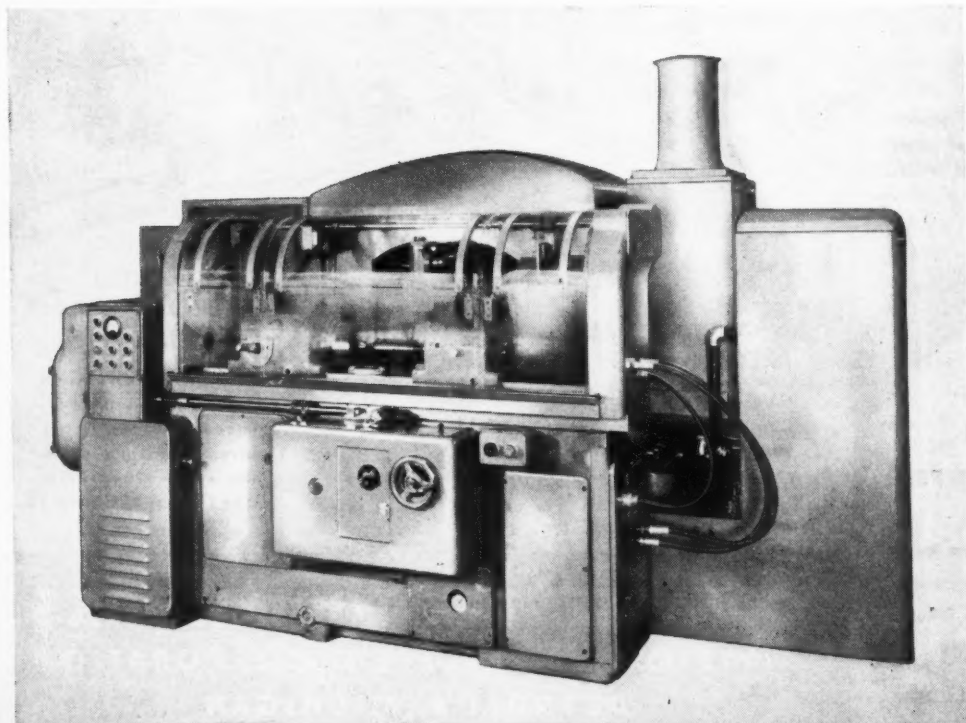
chine is designed to cover the requirements of most production thread- and form-grinding operations. A feature of the machine is the application of electrical and hydraulic controls to an improved mechanical design. It is adapted for single-rib or multi-rib, one- or two-way, right- or left-hand, single or multiple, straight or taper grinding operations.

All electrical controls of the machine are enclosed in a floor mounted housing designed according to machine tool electrical standards. Hydraulic control of the feeds, wheel withdrawal, and other mechanisms insures smooth operation. .... 53

### Jones & Lamson Thread- and Form-Grinding Machine

The Jones & Lamson Machine Co., Springfield, Vt., has just brought out a new 6 by 30 automatic multi-rib thread- and

form-grinding machine arranged to employ both crushed and diamond-wheel dressing methods. The built-in cycle control of this ma-



Jones & Lamson Thread- and Form-grinding Machine Equipped with Electrical and Hydraulic Controls

# Announcing

## A NEW LINE OF PRECISION CONTOUR TURNING AND BORING MACHINES

Accurate and Fast — Cam and Air Actuated

**Featuring** 1. An endless variety of contours or combinations may be generated with a single-point tool. Besides all the regular jobs of straight precision boring and turning, facing and chamfering, it will produce lands, recesses, flanges, steps, counterbores, and radii.

2. A disc type cam for each table gives positive action consistently throughout the day — from the first to the last piece — uninfluenced by temperature changes.

3. Through positive cam action, tool approaches on rapid traverse to within .005 of the work and immediately starts to feed. Tool may cut on feed-in or drawback stroke, or both for rough and finish cuts. On return stroke, tool jumps clear eliminating drag off marks. When moving between intermittent or successive cuts, tool goes into rapid traverse.

4. Uniform temperature, anti-friction bearings, and super-precision spindles provide spindle speeds up to 7,500 RPM. Mechanical precision chucking operated by air cylinders. Neither chucking nor unchucking operation affects preload or position of spindle bearings.

5. Only one dimension need be inspected on any one set-up, regardless of the number of diameters produced by any one single-point tool. Cams control and positively repeat from piece to piece.

6. Set-up of machine depends entirely upon nature of job. Work may be rotated in spindles or mounted on table, loaded from the front of the spindle or through the spindle. Spindles may be raised, lowered, or separated. Two spindles are standard, but more may be added. Changing job set-up simply requires replacing two cams, setting tool for size and changing chucks.



Model 36



### IN THE MIDST OF EVERYTHING AT THE SHOW

You may see this machine in operation in our Booth No. 311 at the Show. We will also have a complete line of six spindle automatic screw machines, four, six and eight spindle chucking machines, a double end chucker, and a new revolutionary turret lathe. We'll be seeing you September 17.



## NEW BRITAIN

*Automatics*

THE NEW BRITAIN MACHINE COMPANY  
NEW BRITAIN-GRIDLEY MACHINE DIVISION  
NEW BRITAIN, CONNECTICUT



Delta Band Saw with Individual and Adjustable Blade Guides and Supports

### Delta 20-Inch Band Saw

A 20-inch band saw primarily designed for wood cutting is being exhibited by the Delta Mfg. Division, Rockwell Mfg. Co., 600 E. Vienna Ave., Milwaukee 1, Wis. The ground table of this machine is 20 inches wide by 24 inches long. Two heavy trunnions, 17 inches apart, on each side of the saw blade, give the table unusual

rigidity. The table tilts 45 degrees to the right and 12 degrees to the left, and can be locked quickly in place at any angle. A scale indicates the angle of cut. Adjustable three-point mountings between the working parts of the machine and the welded steel frame are used throughout to maintain exact alignment.

Anti-friction bearing guides, adjustable for blades up to 1 inch wide, are provided both above and

below the table. The upper guide can be brought down against the work and the lower guide comes within 1 inch of the bottom of the work. Accurate adjustments can be made quickly with micrometer screws. The guides and blade supports can be independently adjusted. The statically balanced wheels are mounted in sealed anti-friction bearings. A saw blade speed of either 3800 or 4500 feet per minute is obtainable. ....54

### Universal Machine Tool

An exceptionally versatile metal-working machine developed for use in machine shops, tool-rooms, and model and experimental work shops is being distributed by Zwicky Brothers, 88-13 Ninetieth St., Woodhaven, N. Y. As shown in Figs. 1 and 2, this machine consists essentially of a bed with ways similar to those of a regular lathe; carriage; tailstock and a number of attachments; headstock and reversible driving motor; and a rigid mounting base of gun-cradle design which permits swiveling the whole machine from the horizontal working position shown in Fig. 1 to the vertical position illustrated in Fig. 2.

The 90-degree swiveling feature, headstock height adjustment, and the ingeniously designed accessories make it possible for this machine to perform a wide range

of metal-working and finishing operations for which as many as fifteen conventional type machine tools are commonly employed, including screw-cutting lathes, surfacing lathes, horizontal milling machines, vertical milling machines, high-speed drilling machines, vertical drilling machines, jig boring machines, slotting machines, surface grinders, internal and external cylindrical grinders, tool grinders, brushing and polishing machines, and power hacksaws.

The machine is built in three types. When used as a screw-cutting lathe it has a center height of  $4 \frac{5}{16}$  inches. The machine shown has a distance between centers of  $16 \frac{11}{16}$  inches, but a larger machine is built with a 29-inch center distance. Work  $4 \frac{11}{16}$  inches in diameter

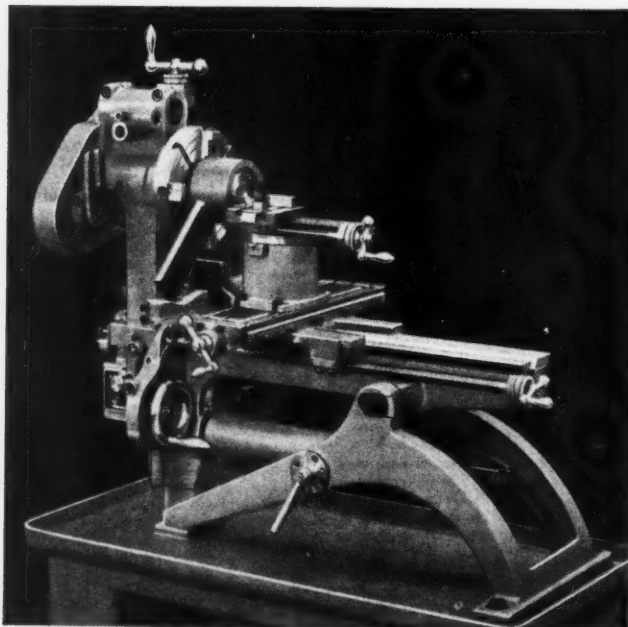


Fig. 1. Universal Machine Set up for Facing Operation on a Forging

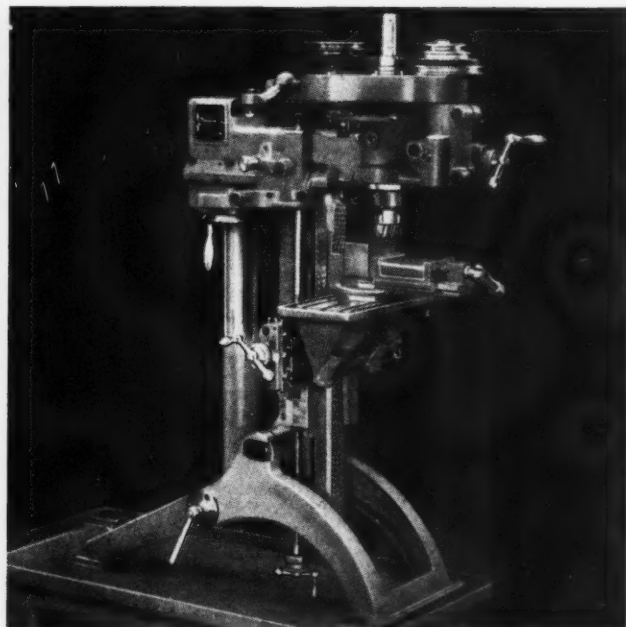
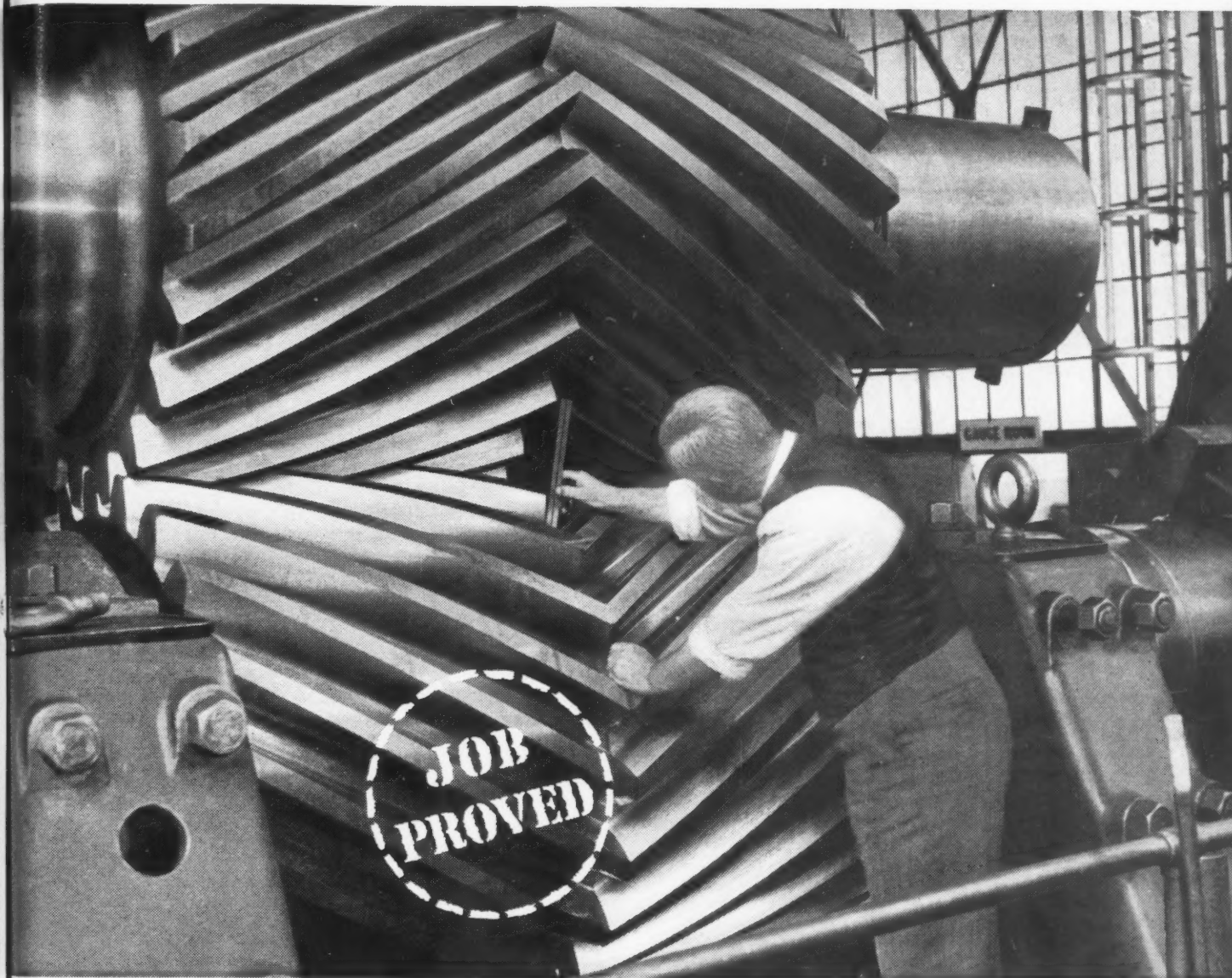


Fig. 2. Machine Illustrated in Fig. 1 Raised to a Vertical Position





# Production Up 22% on 44-Inch Pinion Gears



## SUNICUT...

**Enables Gear Manufacturer to Increase Feed, Speed, and Tool Life; and to Improve Finish**

Since changing to Sunicut, a manufacturer of steel-mill gears has increased production by 22%, improved finish, and added greatly to the life of his gear cutters.

**Operation:** Cutting 44" herringbone gears.

**Machine:** Dominion herringbone gear generator.

**Materials:** Stainless steel, high carbon steel, bronze, other alloys.

**Cutting Oil:** Sunicut.

**This case is just one of thousands** in which experienced production men have found that Sun "Job Proved" cutting oils help to increase production and to improve quality as well.

**Sunicut is a clear, free-flowing cutting oil**, produced by an exclusive Sun process. It has high lubricating value and has excellent heat-dissipating and anti-weld properties. It makes possible heavy cuts at high speed while accuracy and satin-smooth finish are maintained. For full information call your Sun Cutting Oil Engineer or write Department M-9.

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**INDUSTRIAL  
PRODUCTS**

can be machined above the traversing carriage. The carriage power feed has automatic stop control. The thread-cutting range is from 8 to 80 threads per inch. It will cut right- and left-hand threads. Metric threads between 0.25 and 3 millimeter pitch can also be cut. When used as a surfacing lathe, the height above center is 8 1/16 inches.

The maximum milling length is 7 7/8 inches. The milling table surface is 17 11/16 by 4 11/16 inches. Maximum drilling capacity is 3/4 inch to a depth of 2 5/16 inches. Slotting can be done on 1- to 2-inch stock at the rate of 75 to 125 strokes per minute. The machine has a capacity

for surface grinding work 6 11/16 inches in length by approximately 5 1/2 inches in width.

Internal and external cylindrical grinding operations can be performed with the flexible-shaft grinding-wheel spindle, the speed being 4600 R.P.M. for external and 25,000 R.P.M. for internal grinding. Tool-grinding operations can be performed on cylindrical and tapered tools with either straight or helical teeth. The power hacksaw attachment has a blade 11 13/16 inches in length and a capacity for sawing 4-inch circular or square-section bars. The weight of the small machine without the stand is 386 pounds. .... 55

### Chambersburg High-Frame Forging Hammer and Steel Side Frame Press

A single high-frame hammer of the design shown in Fig. 1 and a steel side press illustrated in Fig. 2 have been brought out by the Chambersburg Engineering Co., Chambersburg, Pa. The single high-frame hammer has a new automatically lubricated cylinder with patented differential port designs developed to reduce operating costs.

Heat-treated, ground-face, alloy-forged steel dies facilitate forging the tougher steels with less frequent redressing. The induction-hardened piston-rings used in this machine have a wearing quality that is said to greatly prolong their life.

A self-seating rotary type throttle valve directly connected to the throttle control has been

developed to insure more efficient application of air or steam pressure, and a heavier anvil is provided to obtain more forgings per blow. With this machine, it is possible to forge large disks and rings, upset high stems, form arch bars, and perform other similar work.

The improved Chambersburg trimming press has patented forged-steel side frames of tongue-and-groove construction designed to bind the base and yoke into a rigid unit. The forged-steel side construction and the friction slip mechanism permit the flywheel to expend its energy at predetermined loads, and thus insures the press against damage through overloading.

The interlocking frame construction is said to prevent sway and to insure rigidity, while the friction slip mechanism serves to prevent locking, jamming, and breakage when the press becomes stalled through overloading. This press was designed primarily for trimming operations in forge shops, but it can also be used advantageously for sizing operations and for all forms of blanking, punching, bending, and shaping. It is furnished in single- and double-crank models. .... 56

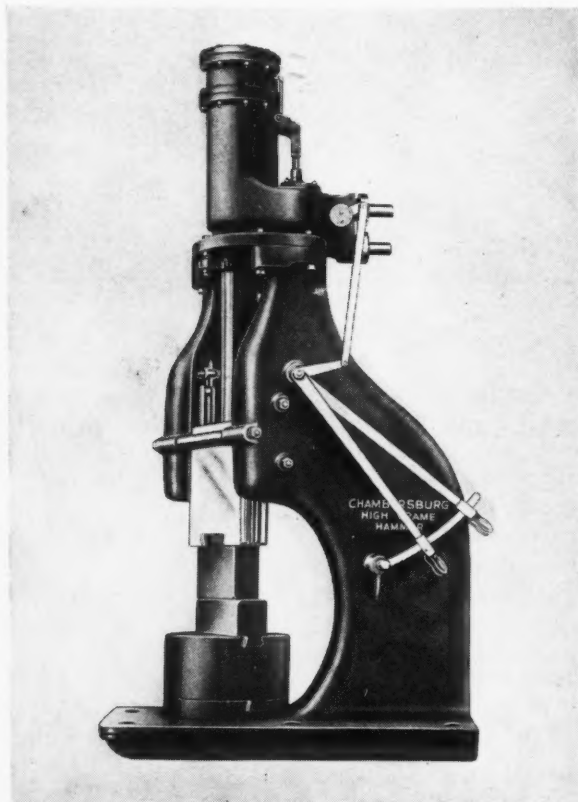


Fig. 1. Chambersburg High-frame Forging Hammer

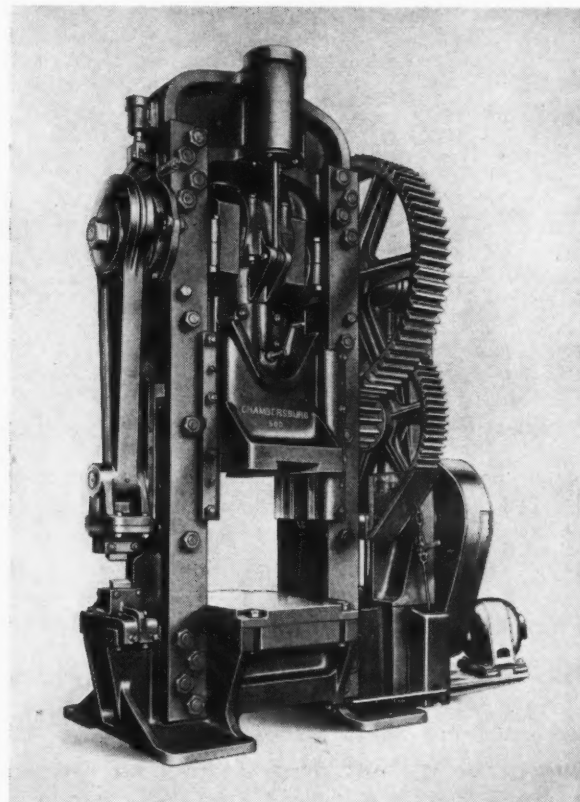


Fig. 2. Improved Steel-side Trimming Press





# MACHINERY'S DATA SHEETS 593 and 594

## GENERAL PROPERTIES AND USES FOR MOLDED PLASTICS MATERIALS—1

Type	Filler	Colors	Applications	Notch Impact Ft.-Lb. per in.	Flexural Strength Pounds per Sq. Inch	Tensile Strength Pounds per Sq. Inch	Water Absorp- tion, Per Cent 48 Hours	Heat Resist- ance, Con- tinuous Deg. F.	Dielectric Strength, Volts per Mil, Step-by-step Test in Oil, 1/8-in. Specimen		Specific Gravity	Shrink- age Inch per Inch*	Bulk Factor†
									25° C.	100° C.			
Phenolic	None	Amber-green, Ruby, Turquoise, Tortoise Shell	Milking machine parts and sterilizable equip- ment. Also used for hard synthetic jewels. Thermosetting	0.34 to 0.44	10,000 to 14,000	7000 to 8000	0.1	248	250 to 300	70 to 100	1.28	0.009 to 0.011	2.25
Phenolic	Wood Flour	All Colors except Pastels	For general - purpose molding applications. Thermosetting	0.30 to 0.40	9000 to 12,000	6000 to 8000	0.5 to 1.0	248	300 to 450	60 to 125	1.33 to 1.45	0.006 to 0.009	3
Phenolic	Wood Flour	Natural and Black	For general - purpose high-dielectric applica- tions. Thermosetting	0.28	10,000	7000 to 8000	0.8 to 1.0	248	350 to 500	100 to 200	1.33 to 1.35	0.007 to 0.008	3
Phenolic	Wood Flour	Natural and Black	Parts requiring good water resistance and minimum odor. Thermo- setting.	0.30 to 0.35	9000 to 11,000	5000 to 7000	0.5 to 0.8	248	250	50	1.40	0.008	3
Phenolic	Wood Flour and Graphite	Gun Metal	For bearings, cams, slides, caster wheels, etc., requiring reduced friction. Thermosetting	0.30	8000 to 9000	6000	0.8 to 1.0	248	.....	....	1.42	0.007 to 0.008	3
Phenolic	Asbestos and Wood Flour	Most Colors except Pastels	For heater plugs and insulating pieces re- quiring good heat re- sistance. Thermosetting	0.30	9500 to 11,000	6000	0.2 to 0.5	392	250 to 400	50 to 80	1.67 to 1.80	0.005	3
Phenolic	Short- fiber Asbestos	Black and Brown	For parts requiring bet- ter heat resistance and for low power arc re- sistance. Thermosetting	0.30	9000 to 10,000	6000	0.01 to 1.0	428	250 to 400	50 to 80	1.80 to 1.90	0.003 to 0.005	3
Phenolic	Long- fiber Asbestos	Black and Brown	Best phenolic for heat resistance, low moisture absorption, low coef- ficient of expansion, and maximum dimen- sional stability. Thermo- setting.	0.36 to 0.40	9000 to 9500	5000 to 6000	0.01 to 0.1	428	250 to 400	50 to 80	1.80	0.003 to 0.004	3

\*See Data Sheet No. 594.  
†See Data Sheet No. 594.

MACHINERY'S Data Sheet No. 593, September, 1947

Compiled by the Shaw Insulator Co.  
Irvington, N. J.

## GENERAL PROPERTIES AND USES FOR MOLDED PLASTICS MATERIALS—2

Type	Filler	Colors	Applications	Notch Impact Ft.-Lb. per in.	Flexural Strength Pounds per Sq. Inch	Tensile Strength Pounds per Sq. Inch	Water Absorp- tion, Per Cent 48 Hours	Heat Resist- ance, Con- tinuous Deg. F.	Dielectric Strength, Volts per Mil, Step-by-step Test in Oil, 1/8-in. Specimen		Specific Gravity	Shrink- age Inch per Inch*	Bulk Factor†
									25° C.	100° C.			
Phenolic	Asbestos and Graphite	Gun Metal	For bearings, slides, valves, cams, etc., re- quiring maximum heat- resistance and dimen- sional stability with good resistance to wear. Thermosetting	0.28	8000 to 9000	6000	0.01 to 0.1	428	.....	....	1.75	0.003 to 0.004	3
Phenolic	Asbestos	Natural and Brown	For high-heat and high- impact applications. Thermosetting	0.50	10,000	6500	0.3	428	125	50	1.80 to 1.85	0.002 to 0.003	6
Phenolic	Asbestos	Natural and Dark Tan	For high-heat — low- flame—high-impact ap- plications. Thermoset- ting.	3.40	10,000	6200	0.8	392	70 to 100	50 to 70	1.60 to 1.70	0.003 to 0.004	5
Phenolic	Mica	Natural and Black	For electrical applica- tions requiring improved heat and low-moisture absorption. Thermo- setting.	0.30	8000	6000	0.01 to 0.05	428	300 to 500	150 to 300	1.88 to 1.92	0.002 to 0.004	2.5
Phenolic	Cotton Flock	Most Dark Colors	A general-purpose mold- ing material with im- proved impact resist- ance. Thermosetting	0.42 to 0.60	9500 to 12,000	7000 to 8500	0.8 to 1.0	248	250 to 300	60 to 80	1.36 to 1.42	0.003 to 0.006	4
Phenolic	Cotton Flock	Black	Combines good water resistance, minimum odor, and improved im- pact resistance. Thermo- setting	0.52	10,000	6500	0.8 to 1.0	248	125	40 to 50	1.42	0.004 to 0.005	4
Phenolic	Fabric— Short Fiber	Natural, Black, Red, Brown	A medium-high impact material with good flow for complex sections. Thermosetting	1.00 to 1.80	10,000 to 12,000	6000 to 6500	1.0	248	200 to 250	50 to 80	1.38 to 1.42	0.003 to 0.004	5

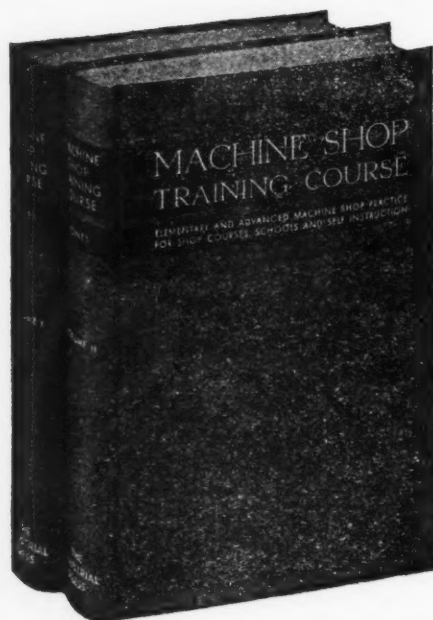
\*Shrinkage values in table give amount of shrinkage in inches per inch of molding materials after they are molded under average conditions. Allowance must be made in the mold design to compensate for this shrinkage.  
†Bulk factor is the ratio of the volume of compound before molding to the volume of the molded piece. Molds must be designed to allow sufficient space for loading the molding compound.

MACHINERY'S Data Sheet No. 594, September, 1947

Compiled by the Shaw Insulator Co.  
Irvington, N. J.

# Machine Shop Training Course

## WITH BLUEPRINT READING CHARTS



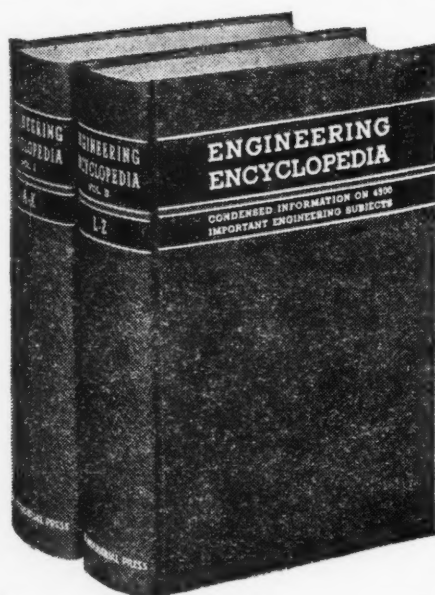
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with Order, \$2 Monthly**

**THE INDUSTRIAL PRESS, 148 Lafayette Street, New York 13, N. Y.**

This standard treatise on machine shop practice in two volumes is for the shop man who wants to supplement his own experience with a broad fund of practical knowledge; for use as a textbook and guide in shop training courses; for technical or trade schools; for designers who want the fundamentals of machine shop practice; for mechanical engineering students.

The MACHINE SHOP TRAINING COURSE contains over 1100 pages of questions and answers. These questions deal with the elements of machine shop practice and other subjects closely allied to the work of the shop. The answers are packed with useful facts, shop rules, typical shop problems and their solutions. 524 drawings and photographs illustrate all kinds of machining operations, cutting tools, gages, etc.

# A World of Engineering Knowledge in Two Volumes



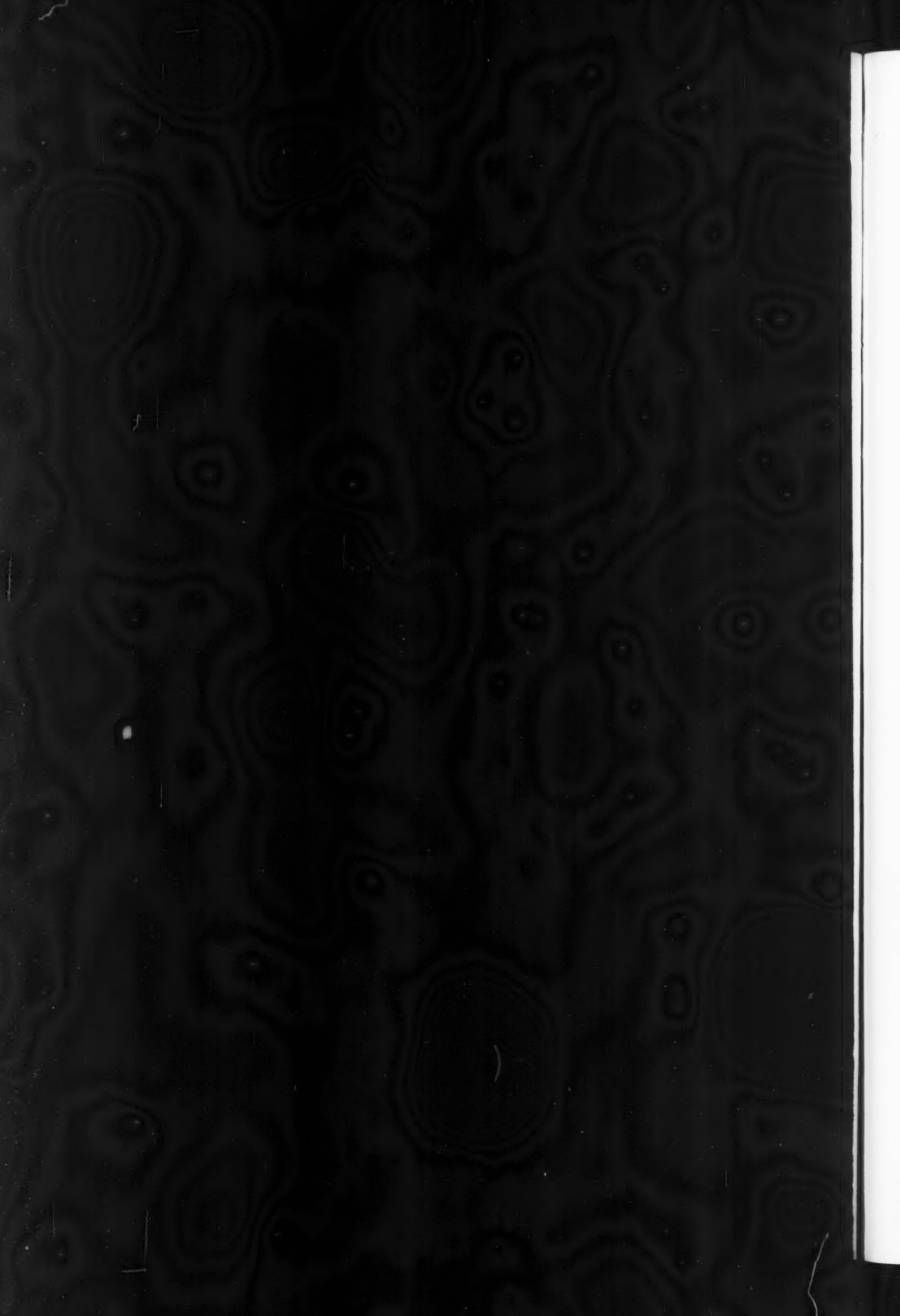
**1431 pages, 4500 subjects**

**THE INDUSTRIAL PRESS, 148 Lafayette Street, New York 13, N. Y.**

The Engineering Encyclopedia is for everyone who can use essential facts about thousands of standard and special engineering subjects. It consists of clearly written concise treatises, definitions of terms used in engineering and manufacturing practice, and the results of many costly and important tests and experiments.

This work of reference supplies such practical and useful information as the important mechanical laws, rules, and principles; physical properties and compositions of standard and special metals used in machine construction and other engineering structures; characteristic features and functions of machine tools and other manufacturing equipment, and many other subjects. Price, \$8.00 set.





## DoAll "Handraulic" Surface Grinder and High-Speed Band Saws

Among the machine tools that the DoAll Co., Des Plaines, Ill., will have on exhibition at its Des Plaines plant during the National Machine Tool Show in Chicago, September 17 to 26, will be the new "Handraulic" surface grinder, shown in Fig. 1, and a new light production band saw, illustrated in Fig. 2. The company's exhibit at the Machine Tool Show (Booth 37) at the Dodge-Chicago Plant will also include some of the company's new products. Also at the Production and Machine Tool Show to be held at the International Amphitheater, 42nd and Halsted Sts., this company will show at Booth 100, a film featuring its sawing machines.

The new "Handraulic" surface grinder has been designed to combine the finger-tip control features of the hand-operated grinder with the smooth automatic power feeds employed in hydraulically operated grinders. Instead of a handwheel-operated rack and pinion, a direct-coupled hydraulic cylinder is used to actuate the table feed. Starting, stopping, and reversing of the table are con-

trolled by a self-centering four-way valve, operated by a 6-inch hand-lever provided with a ball-shaped handle.

Stepless adjustment of the table speeds from 5 to 50 feet per minute is obtained by a valve located next to the ball-handle control lever. New type combination trip-dogs regulate the length of the table travel. These trip-dogs can be set either to stop the table automatically by returning the control lever to the neutral position or to stop it instantly at a predetermined point, regardless of the position of the control lever.

The manually operated 1-inch cross-feed screw is located centrally between the cross-ways, and has an attached handwheel graduated in increments of 0.001 inch. Settings to 0.0001 inch are made possible by the built-in vernier.

Standard equipment includes a cartridge type precision ball-bearing spindle directly driven by a 1-H.P. motor. A separate 3/4-H.P. motor is employed to drive the hydraulic pump. The machine comes equipped for dry grinding, but splash guards and a coolant

unit are available for wet grinding. The table has a working surface 6 1/2 by 19 3/4 inches.

The band saw shown in Fig. 2 is one of two new band saws brought out by the DoAll Co. to cover a wide range of high-speed woodworking requirements. This band saw is adapted for use on pattern and cabinet work and in home workshops. Although small in size, it has ample capacity, power, and rigidity for high-speed precision contour sawing. The throat depth is 16 inches, the work thickness capacity 12 1/8 inches, and the table size 20 by 20 inches. The table can be tilted to an angle of 45 degrees to the right and 5 degrees to the left.

One model makes available four speeds—2000, 3000, 4000, and 5000 feet per minute—through a four-step cone pulley, while the other model has a high and a low range of 100 to 300, and 1700 to 5100 feet per minute, obtained through a transmission and Speed-master variable drive. Both machines will accommodate spiral, buttress, precision, or scalloped type blades in sizes from 1/16 to 5/8 inch. A variety of guides can be used, and a motor of 1/2 or 3/4 H.P. can be employed.....57



Fig. 1. DoAll "Handraulic" Surface Grinder



Fig. 2. High-speed Band Saw Built by DoAll Co.

To obtain additional information on equipment described on this page, see lower part of page 266.

## Canedy-Otto Hydraulic Power Feed for Sliding-Head Floor Drill

The Canedy-Otto Mfg. Co., Chicago Heights, Ill., has announced that it will have on exhibition at the Production and Machine Tool Show, International Amphitheater, Forty-second and Halstead Sts., Chicago, Ill., from September 17 to 26, a hydraulic power feed for its sliding-head drill presses. This feeding attachment will be incorporated in new Canedy-Otto drill presses, and will be available for easy attachment to existing models. It converts these semi-automatic drill presses into fully automatic drilling machines, pro-

viding them with exceptionally convenient and accurate control for use under varying conditions.

The hydraulic power feed can be operated manually and semi-automatically, as well as automatically, and can be easily adjusted for obtaining various rates of feed. Machines or units equipped with this feed can be employed for honing, lapping, tapping, and drilling operations. The automatic feature provides for imparting a continuous reciprocating motion to the machine spindle when desired. .... 58

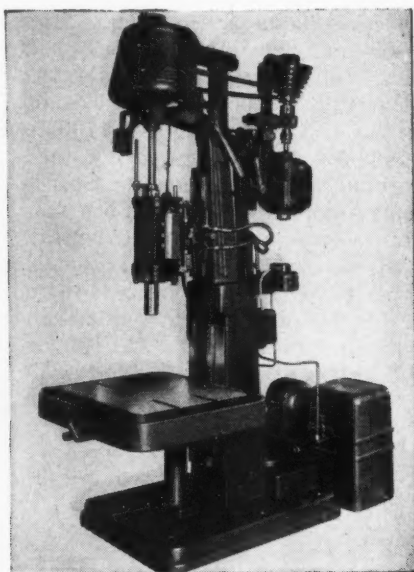


Fig. 1. Canedy-Otto Drill Press Equipped with New Hydraulic Power Feed

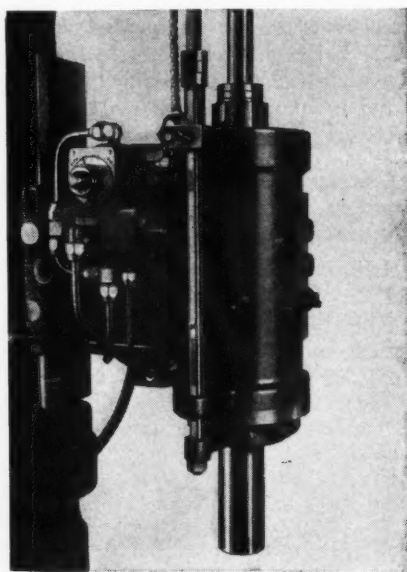
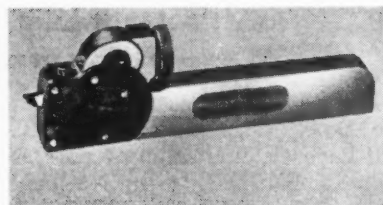


Fig. 2. Close-up View of Canedy-Otto Hydraulic Power-feed Installation



Threading Tool Holder Made by Guarantee Tool Co.

## Spring-Backed Threading Tool

The time required to chase a thread in a lathe is said to be considerably reduced by the use of a new threading tool holder recently placed on the market by the Guarantee Tool Co., Inc., 96 Maple St., West Orange, N. J. This holder is so designed that the cutting tool retracts in a horizontal plane away from the work when the pressure is too great for efficient cutting, thus preventing breakage of the tool point or damage to the work-piece; an adjustment on the holder permits increasing or decreasing the horizontal pressure when the tool is in operation. Because of this horizontal, rather than vertical, movement, less clearance is required at the cutting point of the tool, thus providing greater support for the cutting surface and permitting heavier, more uniform cuts.

The tool-holder is 6 inches long and 2 inches high, the shank being 1/2 inch wide, 1 inch high, and 5 inches long. Both the shank and side guards are surface hardened and rustproofed. ....59

## To Obtain Additional Information on Shop Equipment

Which of the new or improved equipment described in this section is likely to prove advantageous in your shop? To obtain additional information or catalogues about such equipment, fill in below the identifying number found at the end of each description—or write directly to the manufacturer, mentioning machine as described in September, 1947, MACHINERY.

No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
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# New Trade Literature

## RECENT PUBLICATIONS ON MACHINE SHOP EQUIPMENT, UNIT PARTS, AND MATERIALS

*To Obtain Copies, Fill in on Form at Bottom of Page 270 the Identifying Number at End of Descriptive Paragraph, or Write Directly to Manufacturer, Mentioning Catalogue Described in the September, 1947, Number of MACHINERY*

### Multiple-Spindle Drilling and Tapping Heads

ZAGAR TOOL, INC., 23880 Lakeland Blvd., Cleveland 17, Ohio. Data Sheet M-8, giving specifications on multiple-spindle drilling and tapping heads and data of aid in selecting the correct head for the work to be done. Copies can be obtained by those interested if requested on a letter-head, addressed directly to the company.

### Selection and Maintenance of Rubber Belts

B. F. GOODRICH Co., Akron, Ohio. Catalogue Section 2150, containing instructions on the selection, proper care, and maintenance of rubber transmission belting. Tables of horsepower capacities and belt speeds, as well as rules for determining horsepower, formula for finding arc of contact, and other technical data, are included. ....1

### Springs, Axles, Valves, Pumps, Etc.

EATON MFG. Co., Cleveland 10, Ohio. 1947 edition of the company's general catalogue covering its complete line of products, including a number of new developments. The line comprises axles, springs, stampings, lock-washers, valves, pumps, castings, cold-drawn wire, and dynamic devices. ....2

### Grinding Machines

CINCINNATI GRINDERS INC., Cincinnati 9, Ohio. Booklet G-566, containing complete information on Cincinnati 6-inch and 10-inch-L plain hydraulic grinding ma-

chines. Booklet G-570, illustrating and describing the Cincinnati No. 3 centerless grinding machine. Complete specifications are included. ....3

### Milling Machines

CINCINNATI MILLING MACHINE Co., Cincinnati 9, Ohio. Publication M-1532, describing the construction and operation of Cincinnati No. 0-8 vertical milling machines. Publication M-1555, descriptive of Cincinnati Nos. 1-12 and 1-18 plain automatic milling machines. Both catalogues include complete specifications. ....4

### Hydraulic Equipment

SHELL OIL Co., 50 W. 50th St., New York 20, N. Y. Booklet presenting a comprehensive review of hydraulic principles and problems, including chapters on hydraulic systems and equipment; hydraulic oil requirements and performance characteristics; and the maintenance and cleaning of hydraulic systems. ....5

### Welding of Nickel Alloys

INTERNATIONAL NICKEL Co., INC., 67 Wall St., New York 5, N. Y. Booklet 186C listing materials required for the metal-arc, oxy-acetylene, and submerged melt welding of nickel alloys; includes data on type of welding rods to use and other essential information. ....6

### Cast-Bronze Bearings and Bars

BUNTING BRASS & BRONZE Co., Toledo 9, Ohio. Catalogue 46, listing Bunting cast-bronze standard

stock bearings, bronze bars, bronze electric motor bearings, and special bearings. Information on installation press fits and other engineering data are included. ....7

### Tool Engineering Service

BUNELL MACHINE & TOOL Co., 1601 E. 23rd St., Cleveland 14, Ohio. Circular outlining the engineering service offered by this company, which includes the building of special machines, tools, dies, gages, etc.; general machining work; and production contract service. ....8

### Inclinable Punch Presses

WALSH PRESS & DIE Co., DIVISION AMERICAN GAGE & MACHINE Co., 4709 W. Kinzie St., Chicago 44, Ill. Catalogue illustrating and describing ten models of open-back inclinable punch presses with capacities ranging from 6 to 90 tons. ....9

### Grinding Wheels

STERLING GRINDING WHEEL DIVISION, Tiffin, Ohio. Catalogue illustrating and describing, step by step, the production of Sterling grinding wheels, and showing examples of the many different styles of wheels produced and their applications. ....10

### Hydraulic Piercing Equipment

MUELLER ENGINEERING Co., 1116 Book Bldg., Detroit 26, Mich. Catalogue illustrating and describing the company's complete line of hydraulic piercing units with automatic hydraulic stripping device. Engineering data is included. ....11

Safe Operation of Grinding Machines

GRINDING WHEEL MANUFACTURERS ASSOCIATION, 27 Elm St., Worcester 8, Mass. One of a series of booklets dealing with safe operation of grinding machines. The present book is on portable grinding machines. ....12

Full-Automatic Lathe

PRATT & WHITNEY DIVISION NILES-BEMENT-POND Co., West Hartford 1, Conn. Circular 492, describing in detail the Pratt & Whitney Model C 1 1/4- by 18-inch full-automatic lathe, together with examples of typical jobs.....13

Permanent Magnet Design

CRUCIBLE STEEL CO. OF AMERICA, 405 Lexington Ave., New York 17, N. Y. Booklet entitled "Permanent Magnet Design," including fundamental design equations and information on design of stabilized permanent magnets and permanent magnet measurements...14

Grinding and Polishing Equipment

MINNESOTA MINING & MFG. Co., 900 Fauquier Ave., St. Paul 6, Minn. Booklet entitled "Step Up Production," describing the 3M backstand method of finishing metal parts by grinding and polishing. .... 15

Roller-Bearing Universal Joints

MECHANICS UNIVERSAL JOINT DIVISION, BORG-WARNER CORPORA-

TION, 2020 Harrison Ave., Rockford, Ill. Catalogue G1-46, describing the various types of roller-bearing universal joints made by this company. ....16

Grinding Machinery and Wheels

BRIDGEPORT SAFETY EMERY WHEEL Co., INC., Bridgeport, Conn. General catalogue 147, covering the company's complete line of surface grinders, buffing lathes, cut-off machines, and grinding wheels. .... 17

Hydraulic Presses

LAKE ERIE ENGINEERING CORPORATION, 170 Woodward Ave., Buffalo 17, N. Y. Bulletin 147, entitled "Practical Facts About Hydraulic Presses in Modern Industry," covering selection, application, design, installation, and testing of hydraulic presses.....18

Cast-Steel Gears

RACINE STEEL CASTINGS Co., Racine, Wis. Folder 4, entitled "The Outdoor Gears," descriptive of the steel cast-tooth gears and sprockets made by the company for use in road and field equipment. .... 19

Lubrication in Forging Operations

TEXAS Co., 135 E. 42nd St., New York 17, N. Y. Monthly publication *Lubrication* (September, 1947) describes the requirements for successfully lubricating various types of forging machines...20

Forging Data

CHAMPION MACHINE & FORGING Co., 3703 E. 78th St., Cleveland 5, Ohio. First of a series of bulletins describing cost reductions and quality control accomplished by forging a specific part in closed-impression dies. ....21

Bolts, Nuts, and Studs

PAWTUCKET MFG. Co., 333 Pine St., Pawtucket, R. I. Catalogue 46, listing the prices of brass, bronze, stainless-steel, and Monel metal bolts, nuts, washers, and screws in a wide variety of types and sizes. .... 22

Large Forged Nuts

JOS. DYSON & SONS, INC., 5125 St. Clair Ave., Cleveland 14, Ohio. Bulletin 51, containing information on large forged nuts for locomotives, marine vessels, heavy machinery, and other large construction. .... 23

Small Fluid-Power Transmissions

OILGEAR Co., 1340 W. Bruce St., Milwaukee 4, Wis. Bulletin 67110, illustrating and describing the new Oilgear line of small fluid-power variable-speed transmissions ranging up to 3 H.P.....24

Rivet-Spinning Machines

GRANT MFG. & MACHINE Co., Bridgeport 5, Conn. Bulletin giving specifications for the company's complete line of noiseless rivet-spinning machines; data is included on riveting rolls and horn tables. ....25

To Obtain Copies of New Trade Literature

listed in this section (without charge or obligation), fill in below the publications wanted, using the identifying number at the end of each descriptive paragraph; detach and mail within three months of the date of this issue (September, 1947) to MACHINERY, 148 Lafayette Street, New York 13, N. Y.

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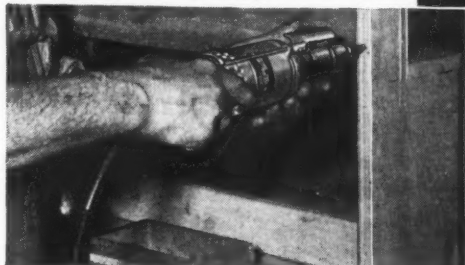
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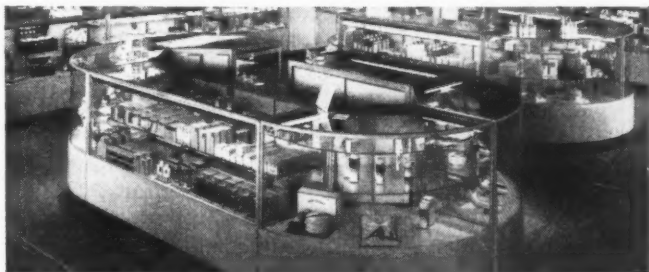
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gouge finished wood, so that expensive repairs or an entirely new piece were necessary. Often costly plate glass would be broken. Phillips Recessed Head Screws put a stop to such spoilage completely.

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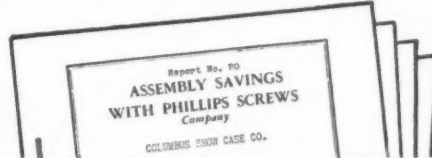
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## Arbors and Gear Tools

AMGEARS, INC., 6633 W. 65th St., Chicago 38, Ill. Catalogue describing the construction of the Amtec spline arbor, designed to solve concentricity problems, and showing applications in various types of fixtures. ....26

## Steel Service Facilities

JOSEPH T. RYERSON & SON, INC., P.O. Box 3817, Terminal Annex, Los Angeles 54, Calif. Booklet briefly describing stocks, facilities, and personnel at the company's new plant in Los Angeles. ....27

## Fork-Lift Handling Trucks

CLARK TRUTRACTOR Division of Clark Equipment Co., 258 W. Champion St., Battle Creek 32, Mich. Booklet describing the "Trucloder," a 1000-pound fork-lift truck for handling a wide variety of jobs. ....28

## Large-Diameter Brass Rods

TITAN METAL MFG. CO., Bellefonte, Pa. Catalogue containing data on Titan large-diameter brass rods, including maximum lengths, compositions, standard specifications, etc. ....29

## Welding and Cutting Equipment

VICTOR EQUIPMENT CO., 844 Folsom St., San Francisco 7, Calif. Catalogue descriptive of Victor gas-welding and flame-cutting apparatus. ....30

## Strip Expander for Hydraulic Equipment

HPL MFG. CO., 2013 E. 65th St., Cleveland 3, Ohio. Folder on HPL strip expanders for fluid sealing on pneumatic or hydraulic equipment. ....31

## Carbide and Cast-Alloy Tipped Tools

ECONOTOOL CO., Jenkintown, Pa. Bulletin describing carbide and cast-alloy tipped "Econotools" for small boring mills, turret lathes, and engine lathes. ....32

## Bolts, Nuts and Screws

J. H. WILLIAMS & Co., 400 Vulcan St., Buffalo 7, N. Y. Circular listing the dimensions, capacities and prices of drop-forged hoist

hooks, eye-bolts, thumb-screws, and rod ends. ....33

## Die-Less Duplicating

O'NEIL-IRWIN MFG. CO., 332 Eighth Ave., Lake City, Minn. Catalogue 47-12, containing 40 pages of information on the Di-Acro system of die-less duplicating and the equipment employed with this process. ....34

## Oxy-Acetylene Cutting

AIR REDUCTION SALES CO., 60 E. 42nd St., New York 17, N. Y. Catalogue containing the reprint of an article entitled "Oxy-Acetylene Cutting in Sheet-Metal Work." ....35

## Balancing Machines

COMMERCE PATTERN FOUNDRY & MACHINE CO., 7450 Melville Ave., Detroit 17, Mich. Catalogues descriptive of the Models 3440 and 3580 "Micro-Poise" static precision balancing machines. ....36

## Arc-Welding Accessories

METAL & THERMIT CORPORATION, 120 Broadway, New York 5, N. Y. Bulletin 120, describing a complete line of arc-welding accessories, including electrode-holders, helmets, eye-shields, etc. ....37

## Adjustable Steel Shelving

PRECISION EQUIPMENT CO., 2658 N. Long Ave., Chicago 39, Ill. Circular giving details on steel shelving equipped with quick-acting clips for rapidly adjusting the space between shelves. ....38

## Mounted Wheels and Mounted Points

NORTON CO., Worcester 6, Mass. Booklet on Norton mounted wheels and mounted points, illustrating standard shapes and sizes and including list prices. ....39

## Safety Tools

AMPCO METAL, INC., Milwaukee 4, Wis. Catalogue 118, illustrating and describing the Ampco line of non-sparking, non-magnetic, and non-corrosive metal safety hand tools. ....40

## Hole-Punching Units

WALES - STRIPPIT CORPORATION, 345 Payne Ave., North Tonawanda, N. Y. Catalogue BL, giving

ing specifications covering Type BL hole-punching units. ....41

## Tapping Machines

PROCUNIER SAFETY CHUCK CO., 18 S. Clinton St., Chicago 6, Ill. Bulletin D-47, describing the latest models of Series D universal tapping machines. ....42

## Gears

NEW YORK GEAR WORKS, 130-35 Ninety-first Ave., Richmond Hill 18, N. Y. Catalogue listing stock gears of all kinds; includes essential gear calculation data. ....43

## Recording Thermometers and Gages

BRISTOL CO., Waterbury, Conn. Bulletin T-835, on the company's new line of Series 500 recording thermometers and gages. ....44

## Industrial Cleaning Machine

L & R MFG. CO., 577 Elm St., Arlington, N. J. Circular describing an industrial precision machine for cleaning, rinsing, polishing, and drying small parts. ....45

## Gears and Sprockets

AMERICAN GEAR & MFG. CO., 5900 Ogden Ave., Chicago 50, Ill. Catalogue 340, listing the company's complete line of stock gears and sprockets, including prices. ....46

## Combustion Systems and Burners

SURFACE COMBUSTION CORPORATION, Toledo 1, Ohio. Booklet describing gas-fired combustion systems and burners. ....47

## Stainless-Steel Wire Cloth

BUFFALO WIRE WORKS CO., INC., 320 Terrace, Buffalo 2, N. Y. Folder 596, on stainless-steel wire cloth, including laboratory ratings on corrosion resistance. ....48

## Portable Arc-Welders

HOBART BROTHERS CO., Troy, Ohio. Circular descriptive of the Hobart portable multi-range arc-welders with dual control. ....49

## Universal Joints

B. M. ROOT CO., York, Pa. Bulletin 163, giving specifications on universal joints for shafts from 1/4 to 7/8 inch in diameter. ....50

# Ingenious MECHANISMS

Mechanisms Selected by Experienced Machine Designers as Typical Examples Applicable in the Construction of Automatic Machines and other Devices

## Mechanism for Converting Rotary to Constant-Velocity Reciprocating Motion

By J. V. NEVILLE

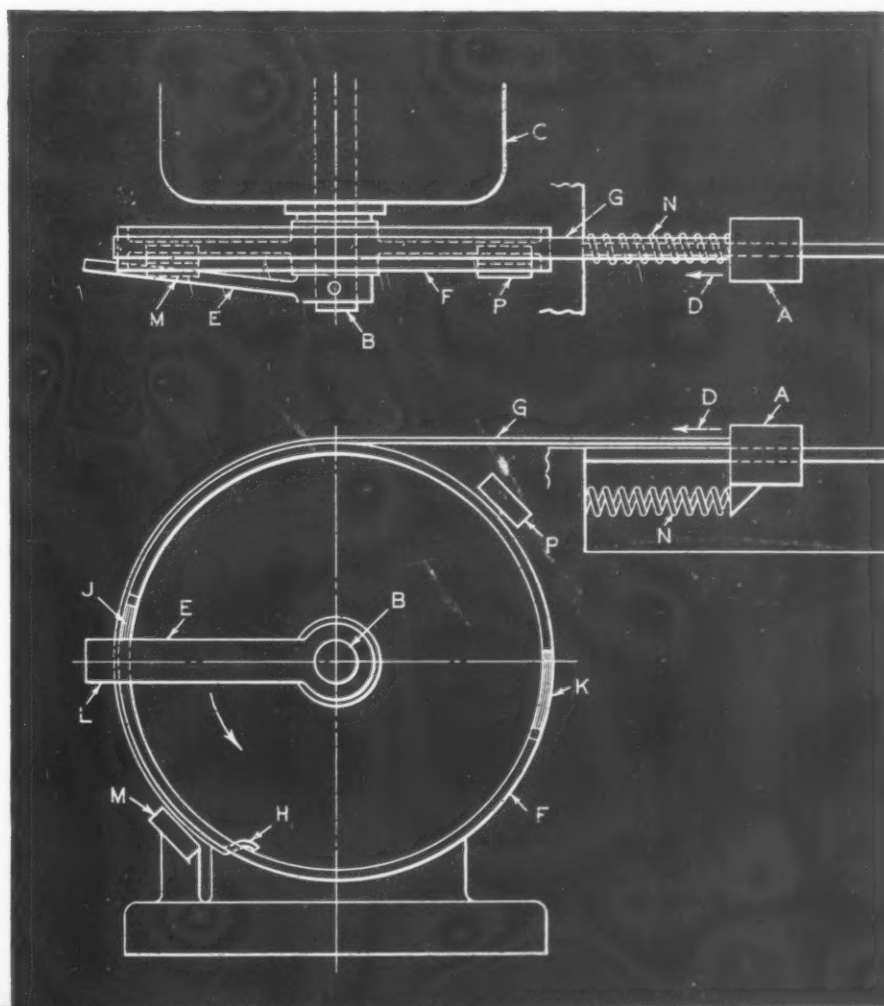
The mechanism shown diagrammatically in the accompanying illustration was devised to impart a reciprocating motion to the sliding member *A* from the rotating shaft *B*. This reciprocating motion was required to operate the bellows of an artificial respiration machine in such a manner as to simulate the inspiration and expiration of natural breathing.

In natural breathing, the expanding movement of the ribs, accompanied by a downward pull of the diaphragm produces a suction power for inhaling air which operates immediately at its full velocity and continues to do so to the end of the inhalation. It is apparent, therefore, that the accelerating and decelerating motion produced by a simple crank mechanism such as is usually employed to convert rotary to reciprocating motion cannot be used to drive the reciprocating bellows-operating member *A*.

The special mechanism devised for this purpose, like the natural mechanism of the chest, immediately starts the flow of air into the lungs at full velocity and continues the flow at a uniform rate to the end of the air injecting motion, after which it causes the air to be withdrawn from the lungs in a similar manner.

To duplicate the rate of natural breathing, the driving motor *C* was equipped with reduction gears to give shaft *B* a uniform speed of 16 R.P.M. The reciprocating motion is imparted to member *A* in the direction indicated by arrow *D* from the rotating shaft *B* through arm *E*, flat-faced wheel *F*, and a flexible steel band *G* in the manner to be described.

Shaft *B*, with the arm *E* secured to it by a pin, rotates in a counter-clockwise direction, causing arm *E* to ride on the rim of wheel *F*, which is a free running fit on shaft *B*. One end of the flexible steel band *G* is fastened to wheel *F* at *H*, and the other end is secured to the bellows-actuating member *A*.



Constant-velocity Reciprocating Motion Mechanism Designed to Operate the Bellows of an Artificial Respiration Machine

The arm *E* is made of spring material, and is so designed that it will automatically drop into slots or notches *J* and *K* in the rim of wheel *F* as it is rotated in a counter-clockwise direction. The illustration shows arm *E* in slot *J*, in which position it acts as a driver for wheel *F*, causing the wheel to rotate counter-clockwise.

This rotation of wheel *F* serves to wind steel band *G* over the face of the wheel and thus pull the bellows operating member *A* to the left, in the direction indicated by arrow *D*. The movement of member *A* continues at a uniform speed until the outer projecting end *L* of arm *E* comes in contact with the cam-faced dog *M*, which lifts the arm out of the driving notch *J* in wheel *F*.

As soon as arm *E* is lifted from the driving slot, the spring *N*, which has been compressed by the movement of *A* to the left, instantly expands and forces member *A* to the right, thus completing the return stroke. This return stroke of member *A* causes wheel *F* to revolve clockwise back to its original starting position, where it is stopped by a device not shown.

The arm *E* then continues to ride or slide on the rim of the wheel until it drops into the slot *K*. The movement of member *A* to the left is then repeated in the manner described until another cam-faced dog *P* disengages arm *E* and allows the spring *N* to return the member *A* again to the starting point. Member *A* travels at a constant velocity during its stroke to the left because the rotating speed of wheel *F* is constant and therefore provides a constant speed for winding the flexible band *G* around the wheel face.

If a power return motion is required for member *A* in place of the spring-actuated return motion, gears can be employed to operate the mechanism in the reverse direction. Since the bellows are only a secondary part of the mechanism, they are not shown.

The notches *J* and *K* in wheel *F* are deep enough to seat arm *E*. One end of each notch is beveled or sloped to allow arm *E* to drop into the slot until it strikes the driving end of the notch which is at right angles to the rim. The dogs *M* and *P* are fixed, and are so positioned that they lift arm *E* out of the notches in wheel *F* at the proper time as it traverses around with the wheel rim, and then allow it to drop back into contact with the rim. It then slides along the edge and in contact with the rim in a counter-clockwise direction while the wheel is being reversed and being moved in a clockwise direction by spring *N*, until it drops into the next notch in the rim edge, which again immediately reverses the motion of wheel *F*.

## Production and Machine Tool Show at Chicago Amphitheater

Approximately 100 exhibitors are expected to show their products at the Production and Machine Tool Show, which will be held at the International Amphitheater in Chicago from September 17 to 26, inclusive. This Show is not to be confused with the Machine Tool Show, also being held in Chicago during the same period.

Machines on exhibit at the Production and Machine Tool Show will include lathes, drill presses, punch presses, grinding machines, band-sawing and filing machines, milling machines, electric arc-welders, die-casting machines, profile grinders, and other types of machines, together with accessories. The Show will be open from 10 A.M. to 9:30 P.M. daily, with the exception of Sunday, September 21.

\* \* \*

## New Method of Evaluating Roughness of Surfaces

A method developed by the National Bureau of Standards to evaluate the roughness of a finished surface permits rapid examination of a relatively large area, prevents scoring of the surface while obtaining the data, and gives a permanent record of the finish.

The method consists of reproducing the surface on a plastic sheet that can then be analyzed by photo-electric means. This replica is produced by applying a suitable solvent, or solution of plastic, to the test surface and pressing on a strip of clear plastic film. When dry, the film, or replica, is readily stripped from the surface.

The surface is evaluated by passing a restricted beam of light through the replica, which is oscillated, and through a restricting diaphragm onto a photo-electric cell. The replica is oscillated with respect to the light beam in a straight line or in a curved path with the path of motion maintained so that the light beam will cross the protuberances and recesses of the surface.

Even minute variations in the number and nature of the protuberances and recesses on the replica film cause corresponding variations in the intensity and angle of refraction of the light transmitted by the replica. The light passing through the restricting diaphragm strikes the photo-electric cell and produces a correspondingly varying current. Meter readings or records are translated into "roughness" evaluations by calibrating against surfaces of known roughness as determined by microscopic means.

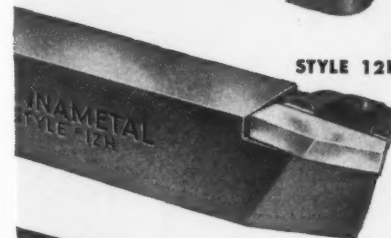
# KENNAMETAL Cutting Tools



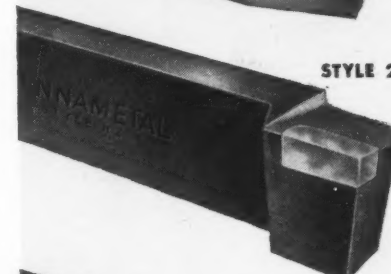
STYLE 12



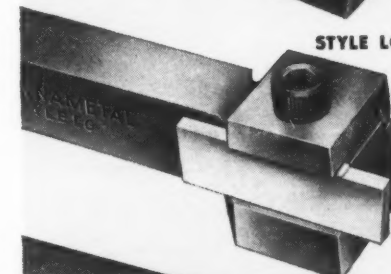
STYLE 6RS



STYLE 12H



STYLE 2



STYLE LG



STYLE 15

The Kennametal tools shown above are representative of more than 60 standard styles—each designed to increase the productivity of machine tools, and reduce tooling costs, on specific metal-cutting jobs. See the complete line at—

**KENNAMETAL DISPLAY**  
Machine Tool Show  
Space 570

## INCREASE THE PRODUCTIVE CAPACITY OF MACHINE TOOLS UP TO 500%

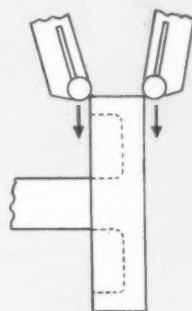
Hard, durable Kennametal cemented carbide cutting tools can turn out from two to five times as much as high speed steel tools on the same machine and in the same time, because—

- they make possible machining at speeds 3 to 10 times as fast as with high speed steel tools,
- last many times as long before needing resharp-ened, thereby greatly reducing machine down-time, and
- cut tougher steels and hard, abrasive cast-iron; as well as steel in the hardened state, thus often saving annealing and rehardening operations.

It's good business to invest thousands of dollars in faster, more powerful machine tools. It's even better business to invest a few extra pennies in long-lived Kennametal cutting tools that enable the machine tool to produce more, in less time, at less cost. For example:

On the straddle-facing job sketched at the right, recently-developed Kennametal "clamped-in solid round" tools (Style 6RS illustrated) have increased production 20%, and are saving \$10.00 per tool per day. This is not extraordinary performance—it is a typical example of the outstanding results obtained by using Kennametal cemented carbide instead of other tool materials, and skillfully engineering it to the job.

*Kennametal tool engineers are at your service to help you get more work from your machine tools. Call upon them. • Kennametal standard tools, that will handle up to 90% of all machining jobs, are listed and priced in Catalog 47. Write for a copy.*

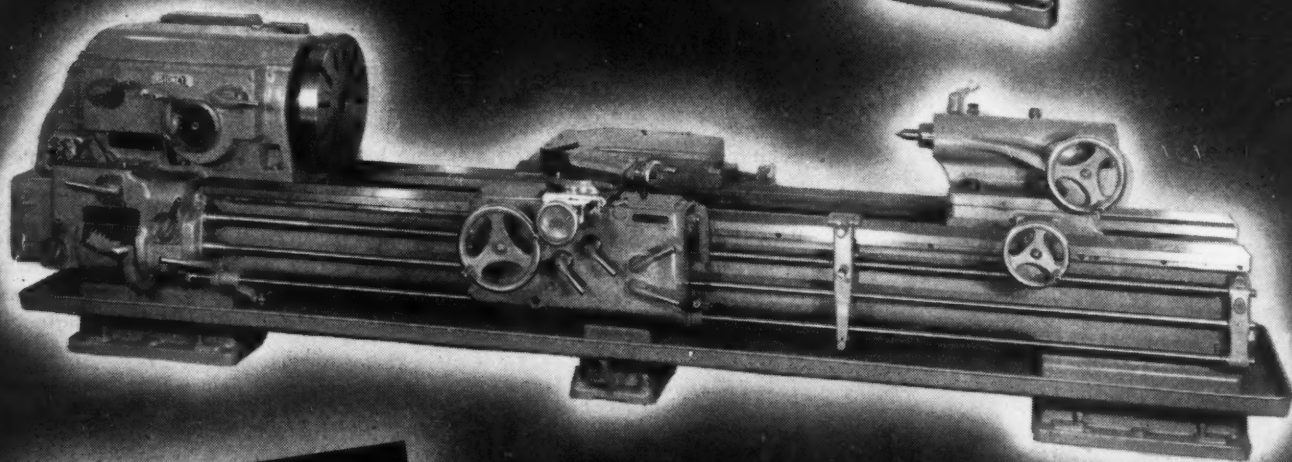
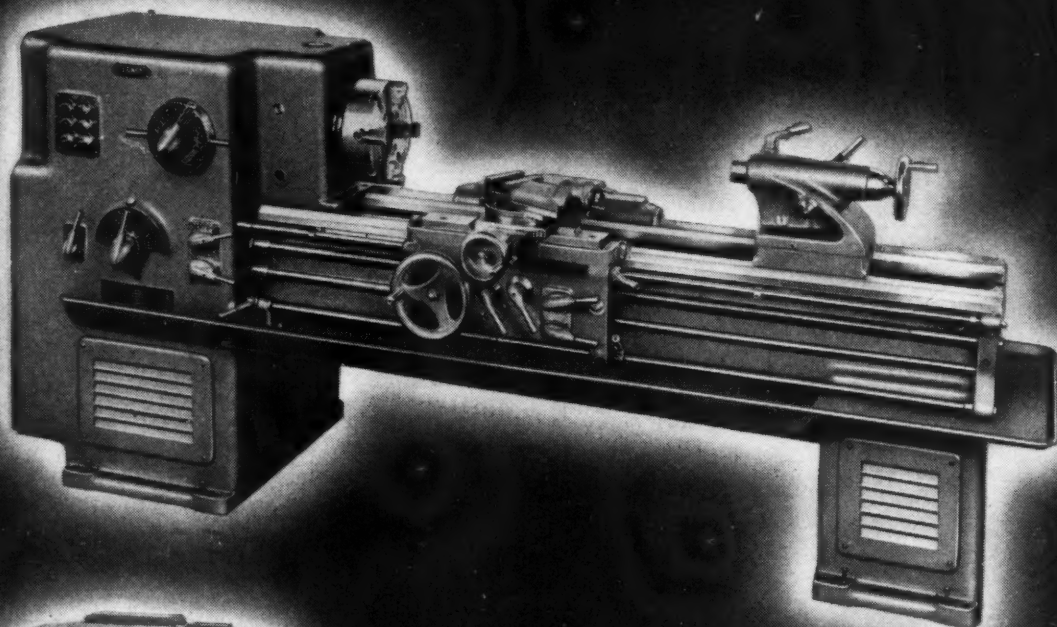


**KENNAMETAL Inc.**  
LATROBE, PA.,

**MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES  
AND CUTTING TOOLS THAT INCREASE PRODUCTION**

# Sidney

PRESENTS AN  
LINE OF ENGINE L



THE  
**SIDNEY**  
MACHINE  
TOOL COMPANY  
SIDNEY • OHIO

..... Builders of Precision Machinery si

# ADVANCED LATHES

*New*-IN DESIGN...

*New*-IN CONVENIENCE...

*New*-IN ACCOMPLISHMENT...

*See them at  
Booth No. 16*

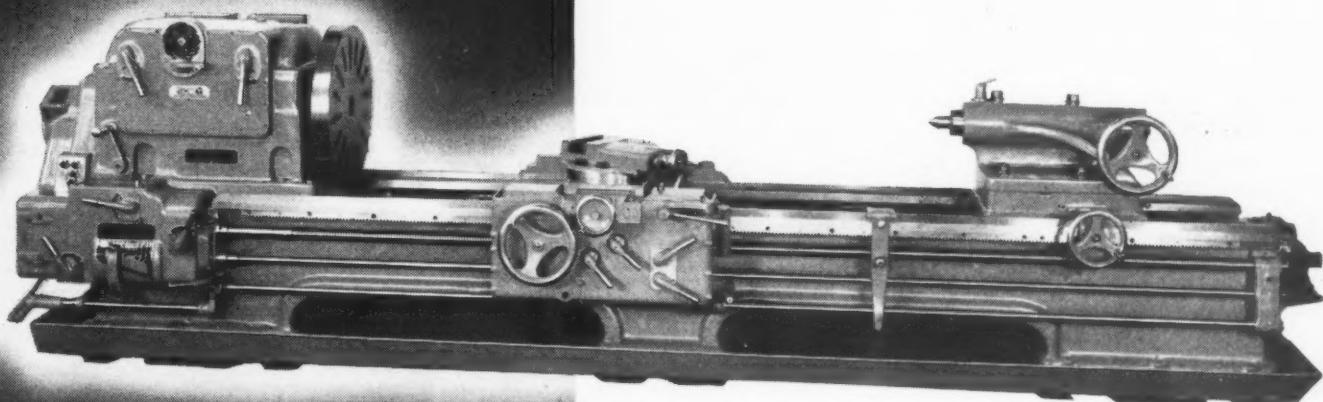
● In this line of new Engine Lathes Sidney has anticipated both the power needs to drive carbide tools and high speeds and feeds required to meet new production demands.

Running at speeds which would have sounded fantastic only a few months ago—you'll be amazed at the speed of these machines—at the ease of control—and at the precision of the work turned by them.

Another distinguishing feature of these lathes is the continuous tooth herringbone geared head developed by Sidney. This unit is largely responsible for the smooth flow of power to the spindle—minimum of back-lash—and freedom from chatter.

Look them over—see them in operation and determine for yourself the many advantages Sidney Lathes offer in greater production—ability to meet close tolerances—and lower cost per piece.

Full descriptive bulletins will be available at the show. If you are unable to attend the show write us for details or ask for a representative to call.



*since 1904.*



# News of the Industry

## California and Oklahoma

AXELSON MFG. Co., Los Angeles, Calif., manufacturer of heavy-duty engine lathes and oil production equipment, has completed negotiations for the establishment of an extensive sales and service organization in Venezuela and Colombia, South America. M. RAY CONGER, who has been with the Axelson pump sales and service division since 1929, will represent the company and will be located at Caracas, Venezuela.

J. K. SUTHERLAND has been appointed sales manager of Benchmark Mfg. Co., Los Angeles, Calif. Mr. Sutherland has been sales manager for the last four years with the Diamond Machine Tool Co.

PAUL I. STEVENS has been appointed works manager of the San Diego, Calif., Division of Consolidated Vultee Aircraft Corporation. Prior to his appointment, Mr. Stevens was manufacturing assistant.

B. C. AMES Co., Waltham, Mass., announces the appointment of the MARSHALL SUPPLY & EQUIPMENT Co. as sales representative in the state of Oklahoma. The Marshall concern, located at 109 W. First St., Tulsa, will handle the Ames line of micrometer dial gages and micrometer dial indicators.

## Georgia

WILLIAM WALTERS is now in charge of field circulation for MACHINERY in nine southern states, including Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. His headquarters are in Atlanta.

## Illinois and Indiana

FANSTEEL METALLURGICAL CORPORATION, North Chicago, Ill., recently acquired the WEIGER-WEED Co., Detroit, Mich., manufacturer of refractory alloys, resistance welding dies, welding fixtures, electrode holders, and resistance welding accessories. The Weiger-Weed Co. will continue to be operated in Detroit under its own name as a division of the Fansteel Metallurgical Corporation.

CRESCENT INDUSTRIES, INC., and the CRESCENT TOOL & DIE Co., Chicago, Ill., have merged, and will operate

under the name of CRESCENT INDUSTRIES, INC. The company will manufacture metal stampings, dies, and tools, and radio equipment. No change will be made in the management personnel.

SUNDSTRAND MACHINE TOOL Co., Rockford, Ill., has appointed W. A. STAUBLIN sales manager of hydraulic equipment for the Hydraulic Division of the company, and has named C. W. LANG sales manager of the Oil Burner Pump Division.

J. G. GREEN has been appointed Midwestern representative for the Baker Industrial Truck Division of Baker-Raulang Co. Mr. Green's headquarters will be at 407 S. Dearborn St., Chicago, Ill.

E. L. ESSLEY MACHINERY Co. announces the removal of its offices from 825-845 W. Evergreen Ave., Chicago 22, Ill., to 565 W. Washington Blvd., Chicago 6, Ill.

MARSHALL E. NEIL has been appointed general sales manager of the Mid-States Equipment Corporation, Chicago 16, Ill., manufacturer of alternating-current welders.

P. O. PETERSON has been named vice-president in charge of manufacturing for Studebaker Corporation, South Bend, Ind. He was previously director of purchases. Mr. Peterson succeeds RALPH A. VAIL, who is retiring in accordance with the company's retirement program.

## Michigan and Wisconsin

F. P. ZIMMERLI, chief engineer of the Barnes-Gibson-Raymond Division of the Associated Spring Corporation, Detroit, Mich., will receive the highest award for technical achievement that is conferred by the American Society for Metals in Chicago on October 23. The honor, known as the Albert Sauveur Award, was first given in 1934 to perpetuate the memory of Dr. Albert Sauveur, of Harvard University. The award will be conferred on Mr. Zimmerli for his basic research in the field of shot-peening.

E. W. BLISS Co. is transferring its Michigan sales office from Lansing to the Bliss plant in Hastings, Mich., from which point sales for the entire state, with the exception of the Detroit district, will be handled.



Reginald A. Smith, Sales Manager of the DeVlieg Machine Co.

REGINALD A. SMITH has been appointed sales manager of the DeVlieg Machine Co., Ferndale, Mich. Formerly connected with Alfred Herbert, Ltd., of Coventry, England, he was resident representative in the United States for the Herbert organization from 1939 to 1945.

BOYD V. GIESEY, formerly senior design engineer for the Taylor-Winfield Corporation and for the last two years in charge of the Flash Welder Division of the Progressive Welder Co., Detroit, Mich., has been placed in charge of all sales of resistance welding equipment for the latter concern in the state of Michigan north of Detroit. His headquarters will be at 320 S. Larch St., Lansing, Mich. R. O. WRIGHT, formerly welding applications engineer, will assist him.

PROGRESSIVE WELDER Co., Detroit 12, Mich., has acquired the WARREN ALLOY & MACHINE Co., which has been operating a non-ferrous foundry in Warren, Ohio, and a jig, fixture, die, gage, and punching plant in Detroit. Both plants will be conducted as a division of the Progressive Welder Co. under the name WARREN ALLOY & MACHINE DIVISION.

TWIN DISC CLUTCH Co., Racine, Wis., announces the following appointments in its sales department: C. F. MOHRBACHER, assistant sales manager of the Racine Division; A. E. YOUNG, E. H. BENNETT, and J. B. JENKINS as district managers



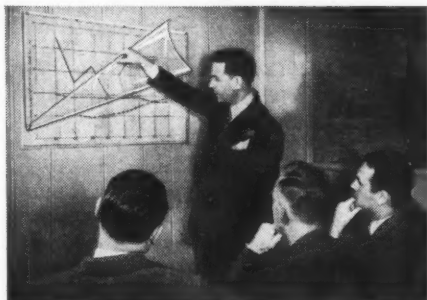
24 illustrated pages.  
126 new dollar-sav-  
ing ideas for every  
business office.

**NEW!**

## Free booklet shows how you can work this "Office Magic"

Reduce typing 95% in sales  
correspondence, etc.

You'll learn how one typed  
letter produces a hundred Ozalid  
copies that look exactly like  
original typing.



Make full-color charts directly from  
pencil tracings. Now it's economical to sell,  
dramatize, visualize with all the colors of  
the rainbow.



For the first time file cards, records, can  
be reproduced in 25 seconds—directly from  
translucent cards. Manual transcription  
(and possibility of errors) is eliminated.



"Photographs" in 25 seconds —com-  
pletely dry, ready for use. You keep film  
positives (made from any negative) on file.  
Make Ozalid Dryphotos whenever needed.



No printing plates required to make  
full-color displays like these. Every adver-  
tiser can save with new revolutionary  
Ozalid techniques.



Accountants always hoped for an  
easier way. Now, whole columns of figures  
from separate reports can be transferred to  
a composite report—positioned side by side,  
any way you like—without lifting a pen,  
without one error in transcription.



You'll find this unbelievably easy short cut  
—and 125 others—fully explained in "The  
Simplest Business System."  
See how you work this "office magic"  
with the new Ozalid Streamliner. Mail  
coupon today.

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Gentlemen: Please send free copy of "The Simplest Business System"... and Ozalid  
prints of typed, drawn, printed and photographic material.

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POSITION \_\_\_\_\_ COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_

Ozalid in Canada—Hughes Owens Co., Ltd., Montreal

in the West Coast, eastern, and Michigan territories, respectively; and P. G. TYRRELL and P. W. WAHLER, assistant district managers at Los Angeles, Calif., and Seattle, Wash., respectively.

## New York and New Jersey

HARRY R. FILLMORE has been appointed general foreman of the Hornell, N. Y., plant of SKF Industries, Inc. This new plant, which is scheduled to begin operations September 1, will manufacture anti-friction pillow blocks, which were formerly produced at the main plant in Philadelphia.

PORTER-CABLE MACHINE Co., Syracuse, N. Y., will exhibit a complete line of wet and dry abrasive belt grinders in Rooms 114 to 116 of the Hotel Sherman, Chicago, September 22 to 26. This exhibit will be held in conjunction with the Machine Tool Show.

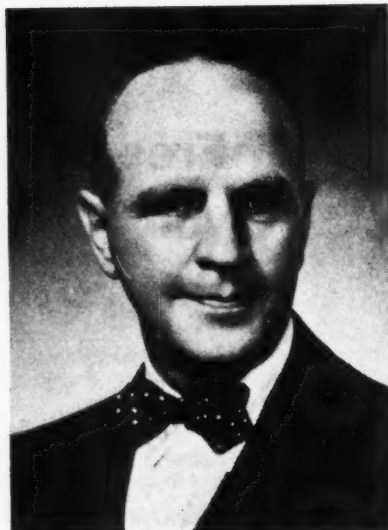
ALFRED MARCHEV, former president and chairman of the board of the Republic Aviation Corporation, has been elected to the board of directors of the Aircraft Screw Products Co. of Long Island City, N. Y.

INDUCTION HEATING CORPORATION announces the removal of its plant and offices to 181 Wythe Ave., Brooklyn 11, N. Y., where larger facilities are available.

C. W. LAPIERRE, formerly manager of the General Electric Co.'s electro-mechanical division of the engineering and consulting laboratory, has joined the American Machine & Foundry Co., 60 Beaver St., New York 4, N. Y., as vice-president in charge



C. W. LaPierre, Vice-president in Charge of Engineering of American Machine & Foundry Co.



T. L. Robinson, Newly Elected President of the Wel-Met Co.



H. L. Kinney, Executive Vice-president of the Wel-Met Co.

of engineering. The company has also appointed H. L. NEWELL, who was previously president of Waring Products Corporation, manager of the central engineering department, with headquarters in Brooklyn.

CONDENSER SERVICE & ENGINEERING Co., Inc., announces the opening of a plant for development work and metal spraying at 601 Newark St., Hoboken, N. J. The company has been engaged in metal spraying work for the last fifteen years, and has three other plants in Pennsylvania and Delaware.

H. S. JAKOBSEN, formerly a partner in the J & S Tool Co., East Orange, N. J., manufacturer of precision form dressers, announces that he has disposed of his interests in that concern.



Affiliated Photo-Conway

H. L. Newell, Manager of Central Engineering Department of American Machine & Foundry Co.

## Ohio

WEL-MET Co., Kent, Ohio, has been purchased by a group of northern Ohio business men. Newly elected officers of the company, all members of the purchasing group, are T. L. ROBINSON, president; H. LESLIE KINNEY, executive vice-president in charge of sales; and LEO R. KUNTZ, secretary and treasurer. Mr. Robinson, head of the company since its inception as a subsidiary of the S. K. Welman Co., was formerly associated with the Amplex Division of the Chrysler Corporation, in Detroit.

BAKER-RAULANG Co., Cleveland, O., is erecting an addition to its factory at 8200 Baker Ave. The building, consisting of four 40- by 100-foot bays, will provide improved facilities for the assembly, testing, and shipping of products from the industrial truck division.

ROBERT A. WEINHARDT has joined Willys-Overland Motors, Inc., Toledo, Ohio, as automotive power plant engineer. He will be in charge of all Willys-Overland engine design.

JACK F. KNOBLOCH, general superintendent of the Weatherhead Co. since 1941, has joined the staff of Jack & Heintz Precision Industries, Inc., Cleveland, Ohio, as superintendent of the ball bearing division.

WADE-MORRISON Co., Cleveland, O., has recently been organized to manufacture conveyor chains. The company has two factories, one at Columbus and the other at Alliance, Ohio, both of which are in production.

A. R. KELSO has been appointed executive vice-president of the Warren City Mfg. Co. and the Warren Stamping Co., both of which are subsidiaries of the Federal Machine and Welder Co., Warren, Ohio.

# Welded Steel Cuts Cost of Base 45%

By W. E. Benninghoff, General Manager  
TOCCO Division

The Ohio Crankshaft Company, Cleveland, Ohio

**B**Y thinking in terms of welded design for the fabrication of parts and assemblies of TOCCO Induction Heating Equipment, we have been able to benefit in two important ways.

1. Day after day, we use welded design in the development of work-handling fixtures and accessories for standard TOCCO machines and in the designing of special TOCCO machines. Each must be built to match a specific application. Welding permits us to use greater ingenuity and freedom in the design of this equipment and to manufacture quicker, at lower cost.

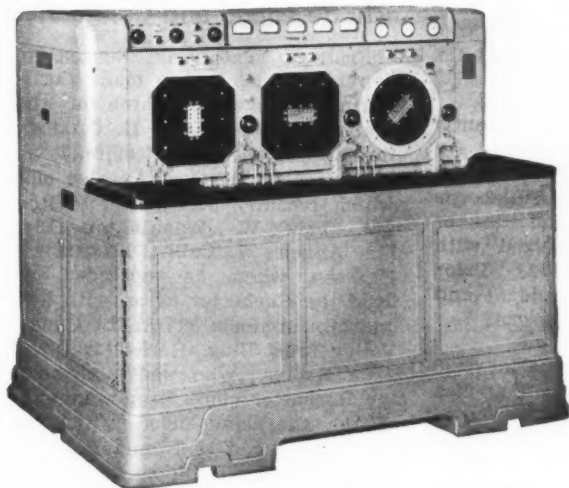


Fig. 1. Completed TOCCO Induction Heating Machine with former base.

2. In the manufacture of our standard TOCCO machines of all sizes and types, we use welded design for many parts to provide maximum rigidity and strength, lighter weight and lower cost. It also enables us to continually improve these parts because we are not restricted by patterns. The cabinet frame of the 150 KW TOCCO unit shown in Fig. 1 is an example of the larger welded steel parts which we have used for some time.

Recently we have also changed the base of the machine shown in Fig. 1 from cast iron to welded steel. The cast iron base weighed 3175 lbs. compared to 1180 lbs. for the welded steel base shown in Fig. 2. It was necessary to machine the top of the cast base to secure level mounting for the motor generator set. The welded base is

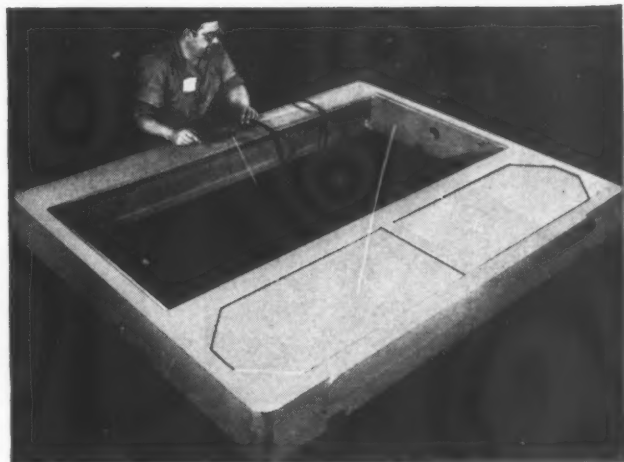


Fig. 2. The new welded steel base for 150 KW machine shown in Fig. 1.

sufficiently level as fabricated and requires no machining, thus providing further saving.

The total net cost saving with the welded steel base is 45%.

The base of this TOCCO machine supports a 150 KW high-frequency motor-generator, transformers, electrical controls and other equipment, housed in a steel cabinet. The total weight of the machine, including the base, is about 12,000 lbs. In service, it must be permanently level, rigid and have good vibration-dampening qualities.

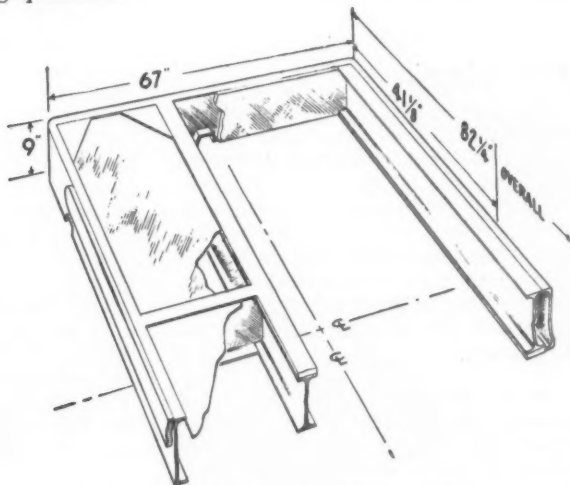


Fig. 3. Schematic drawing of fabricated base.

The construction of the welded steel base is shown in Fig. 3. Made of standard mill shapes and plate, it requires a minimum amount of welding, resulting in close control of tolerances and minimum cost. It is proving highly satisfactory in performance in every respect.

*The above is published by LINCOLN ELECTRIC in the interests of Progress.  
For Studies in Machine Design, write The Lincoln Electric Company, Department 228, Cleveland 1, Ohio.*



Owen G. Watterman, Newly Appointed Sales Manager, Zagar Tool, Inc.



James W. Kinnear, Jr., Executive Vice-president of Firth Sterling Steel & Carbide Corpn.



E. B. Cleborne, Executive Vice-president of Allegheny Ludlum Steel Corporation

OWEN G. WATTEMAN has been appointed sales manager for Zagar Tool, Inc., Cleveland, Ohio, manufacturer of gearless hydraulic drilling and tapping heads, production tools, and special machinery. Mr. Watterman has been connected with the company for more than six years, and has been steadily advanced to his present post.

CHARLES D. ELLIOTT has become associated with the Herbrand Division of the Bingham Stamping Co., Fremont, Ohio, in the capacity of assistant to the manager.

## Pennsylvania

BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa., announces that it has been appointed exclusive American agent for the Huggenberger Tensometers, the importation of which from Switzerland ceased during the war. This instrument was one of the first to simplify strain measurement so as to make it possible to measure strains in the field, as well as in the laboratory.

E. B. BRANT has been appointed district sales manager of the Page Steel and Wire Division, American Chain & Cable Co., Inc., Monessen, Pa., succeeding FRED H. JONES, who has retired because of ill health. Mr. Brant will make his headquarters at 908 Empire Bldg., Pittsburgh, Pa.

JAMES W. KINNEAR, JR., has been appointed executive vice-president of the Firth Sterling Steel & Carbide Corporation, McKeesport, Pa. He formerly held the position of assistant manager of operations of the Pittsburgh district with the Carnegie

Illinois Steel Corporation. Mr. Kinnear's father was one of the men who founded the Firth-Sterling Steel Co. in 1896.

E. B. CLEBORNE was recently elected executive vice-president of the Allegheny Ludlum Steel Corporation, Pittsburgh, Pa. Mr. Cleborne has been vice-president and director since the corporation merged with the Ludlum Steel Co. in 1938. Prior to that, he was a vice-president and director of the Ludlum concern.

PENNSYLVANIA FLEXIBLE METALLIC TUBING Co., Philadelphia, Pa., has appointed H. L. BOETSCH vice-president in charge of sales. T. R. BOYLE, formerly manager of the Syracuse branch of the company, has been made manager of the Chicago branch, located at 4532 W. Harrison St. The post of manager of the Syracuse branch (415 Loew Bldg.) will be filled by J. J. LYNCH.

J. MARCUS WARD was recently elected vice-president in charge of sales for the Heintz Mfg. Co., Philadelphia 20, Pa. Mr. Ward was previously in charge of the Philadelphia sales office. He takes the place of WILLIAM J. BRYANT, who retired last year.

L. R. GARRETSON, since 1925 advertising manager of the Leeds & Northrup Co., Philadelphia, Pa., recently retired because of ill health. His successor is KENNETH W. CONNERS, who has been a member of the advertising department since 1934.

RICHARD M. PAXTON, JR., has been elected vice-president of the Jessop Steel Co., Washington, Pa. He has been connected with the company since 1924.

## Rhode Island and Connecticut

FEDERAL PRODUCTS CORPORATION, Providence, R. I., has made the following changes in three of their branch offices: RALPH H. CHAPMAN, formerly in the Detroit office, is now in charge of the Los Angeles office, which recently was moved to Room 214, 1489 W. Washington Blvd., Los Angeles 7, Calif. KENNETH A. HEINOLD, whom he succeeded, will head the Rochester office, with headquarters in Room 814 in the Genesee Valley Trust Bldg., Rochester 4, N. Y. JACK KELSEY, who was manager of the Rochester office, is now manager of the Cleveland office, which has been moved to 713 Hanna Bldg. Annex, Cleveland 15, Ohio.

The corporation also announces that the Detroit office of the concern, formerly located at 212 Boulevard Bldg., 7310 Woodward Ave., Detroit 2, Mich., has moved into its own building at 17181 Schaefer Highway, Detroit 21, Mich. The office will continue to maintain a stock and repair service, in addition to serving as headquarters for the salesmen in the Detroit territory. A. R. SUPOL has recently joined the Detroit sales office, taking the place of RALPH H. CHAPMAN, who has been appointed manager of the Los Angeles branch office.

FARREL-BIRMINGHAM Co., Inc., Ansonia, Conn., manufacturer of heavy industrial equipment, gears, and gear units, announces that an arrangement has been made with JOHN BEETRAM & SONS Co., Ltd., Dundas, Ontario, Canada, by which that company will build Farrel-Birmingham processing equipment, rolling mill machinery, and hydraulic machinery in Canada.



## Reeves: a name synonymous throughout industry with accurate, variable speed control

In the plants of some 25,000 manufacturers and processors you will find, today, more than 260,000 production machines equipped with infinite, stepless REEVES Speed Control. On the blueprints and catalogs of machine manufacturers you will also see more than 2,100 different makes of machinery calling for REEVES Variable Speed Drives as standard equipment. And, if you'll take a look at the record, you'll soon discover why REEVES is thus accepted as a name synonymous throughout industry with accurate, variable

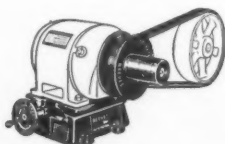
speed control. For the record shows that in the specialized field of speed control engineering no other manufacturer equals REEVES ... either in design, manufacturing and application experience ... in number or variety of installations ... in dollars-and-cents savings to the user ... in completeness of line ... or in the quality of service rendered those who build and use REEVES-equipped machines.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA  
Recognized Leader in the Specialized Field of Speed Control Engineering

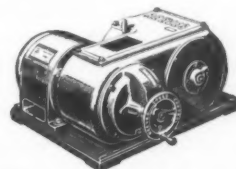
### THE THREE BASIC REEVES SPEED CONTROL UNITS



**VARIABLE SPEED TRANSMISSION** for providing infinite, accurate speed flexibility over a wide range—2:1 to 16:1. Sizes—fractional to 87 hp.



**VARI-SPEED MOTOR PULLEY** converts any standard constant speed motor to a variable speed drive within 4:1 ratio. Sizes to 15 hp.



**MOTODRIVE** combines motor, speed varying mechanism and reduction gears in single compact unit. Speed variations 2:1 to 6:1 inclusive. Sizes to 15 hp.

*Accurate Variable*  
**REEVES Speed Control**  
*Gives the Right Speed for Every Job!*

## Obituaries



### Crawford N. Kirkpatrick

Crawford Neal Kirkpatrick, chairman of the board of the Landis Machine Co., Inc., Waynesboro, Pa., died at his home in Waynesboro on July 28 at the age of fifty-seven years.

Mr. Kirkpatrick, a well-known figure in the machine tool industry and in the metal trades industry, was highly regarded for his progressiveness and leadership. His entire working life was spent with the Landis Machine Co. Starting in the shipping department during his school vacations, he entered the sales department upon his graduation from Dickinson College in 1913.

Through his forceful energy, Mr. Kirkpatrick rose rapidly to an executive position, and successively held the positions of sales manager, secretary, general manager, vice-president, and finally president, which latter position he assumed in 1942 upon the death of J. G. Benedict. Owing to ill health, he was compelled to relinquish his active duties, and in March of this year was elected chairman of the board. He also served as secretary of the Canadian Landis Machine Co., Ltd., Welland, Ontario, as well as a director of both the home and Canadian companies.

He served a term of three years as a director of the National Machine Tool Builders' Association and was treasurer of this Association from 1944 to 1945. He was a member of the National Metal Trades Association, National Industrial Conference Board, Army Ordnance Association, Pennsylvania Society of New York, and served on committees of the War Production Board, National Association of Manufacturers, and American Petroleum Institute.

Mr. Kirkpatrick is survived by his wife and two sons.

### Willard A. Erickson

Willard A. Erickson, for many years assistant manager of the New York office of the Heald Machine Co., Worcester, Mass., died on August 23 of pneumonia. Mr. Erickson was born in Worcester on January 18, 1888, and started working for the Heald Machine Co. in 1907. He was well known in the metal-working industry throughout Massachusetts, Connecticut, New York, and Pennsylvania, and will be sincerely mourned by his friends and business associates. Mr. Erickson was a member of the

Northern New Jersey Chapter of the American Society for Tool Engineers, and also belonged to a number of fraternal organizations.

FRED P. UNDERWOOD, vice-president and secretary of the Vanadium-Alloys Steel Co., Latrobe, Pa., died on August 8 of a heart attack, at the age of sixty-two years. Mr. Underwood joined the Vanadium-Alloys organization in 1915 and became secretary in 1918. In 1945, he was made vice-president of the company.

\* \* \*

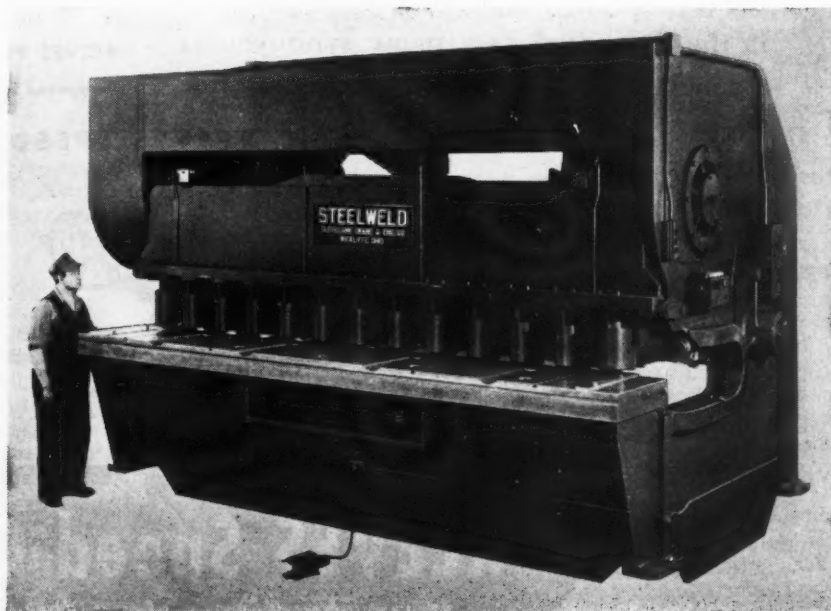
### Magnetic Alloy Used in Light-Weight Motors

A 35 per cent cobalt, 64 per cent iron, 1 per cent chromium alloy that carries more magnetism than any other alloy practical for use in motors and generators and is tough enough to withstand intense vibration has been developed by Dr. Trygve D. Yensen of the Westinghouse Research Laboratories in collaboration with J. K. Stanley. The combination of 35 per cent cobalt with iron gives the highest magnetic saturation point of any known metallic material, and the 1 per cent chromium makes the alloy workable.

The new alloy, "Hiperco," will make possible the building of compact electric motors and generators about 10 per cent smaller and lighter than those of equal power now built for aircraft. This is because the high magnetic saturation point of "Hiperco" will permit the design of motors with less metal for the same power, or with more power from the same amount of metal.

This alloy is the result of twenty years' research, the final difficulty of brittleness being overcome recently.

The Shear Shown is Said to be the Largest ever Built Employing the Pivoted-blade Principle of Operation. It was Recently Completed by the Cleveland Crane & Engineering Co., Wickliffe, Ohio, and is Capable of Cutting 12 Feet of 3/4-inch Steel Plate at Thirty Strokes per Minute. The Press has a Throat 36 Inches Deep, which Permits Slitting Very Wide Plate; Ball-bearing Transfers Mounted on the Top of the Bed Facilitate the Movement of Such Heavy Material





Condition of hole: un-drilled.  
Material: SAE 1020 cold-rolled  
flat stock rolled to shape.  
Stock thickness: 0.125 inches.  
Length of full thread: 2 1/4 inches.

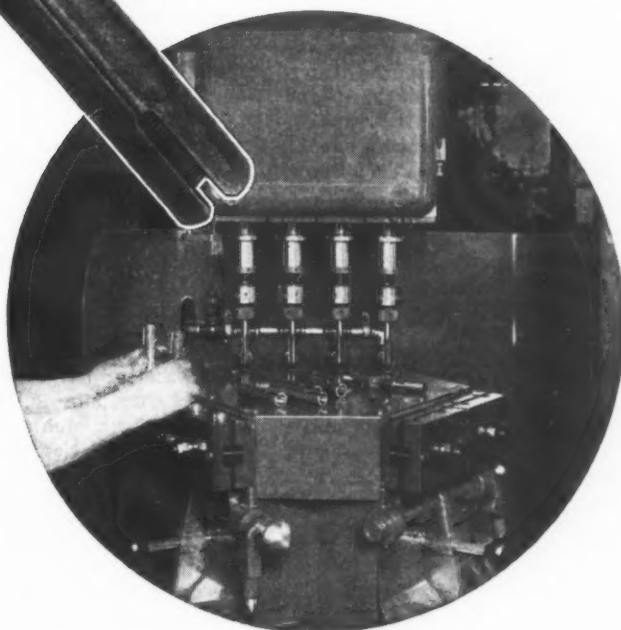
# Boost Output per grind 185% on turnbuckles

(plus 33% more  
grinds per tap)

The average high speed steel tap produced some 175 pieces in this operation before re-grinding was necessary.

Taps made of "M-11" (Detroit Tap's exclusive chrome-cobalt HSS) however, average 500 finished turnbuckles per grind. In addition, it was found possible to re-sharpen the "M-11" taps 8 times as against 6 for conventional HSS.

Equipment now used to produce some 12,000 parts per machine per 24 hour day are two specially designed "Detroit" 4-tap multiple head lead-screw machines with indexing fixtures, having automatic clamping, automatic unloading and simple manual loading. Spindle speed is 250 RPM while tapping, 500 RPM for backing out. Taps are 11/16" - 18 RH and LH, and of course are "M-11".



The reason why taps of M-11 steel\* give such outstanding performance is that the steel has higher abrasion resistance (longer life); higher toughness with hardness (less chance of breakage or chipping); higher red hardness (efficient tapping at higher speeds); and higher torsional strength (greater resistance to twisting and breakage). Yet they cost no more.

## DETROIT

TAP & TOOL CO.

8432 BUTLER AVE. • DETROIT 11, U.S.A.

\*M-11 steel is used exclusively in Detroit taps, thread milling cutters and thread plug gages.

## Coming Events

**SEPTEMBER 1-4**—Fall meeting of the **AMERICAN SOCIETY OF MECHANICAL ENGINEERS** at the Hotel Utah, Salt Lake City, Utah. Secretary, Clarence E. Davies, 29 W. 39th St., New York 18, N. Y.

**SEPTEMBER 8-12**—**SECOND NATIONAL INSTRUMENT CONFERENCE AND INSTRUMENT EXHIBIT** in Chicago, Ill., under the auspices of the Instrument Society of America. Further information can be obtained from T. W. Robinson, Chairman, Exhibit Committee, 236 N. Clark St., Chicago 1, Ill.

**SEPTEMBER 17-18**—Tractor meeting of the **SOCIETY OF AUTOMOTIVE ENGINEERS** at the Hotel Schroeder, Milwaukee, Wis. Secretary and general manager, John A. C. Warner, 29 W. 39th St., New York 18, N. Y.

**SEPTEMBER 17-26**—**MACHINE TOOL SHOW** at the Dodge-Chicago plant, Chicago, Ill., under the auspices of the National Machine Tool Builders' Association, 10525 Carnegie Ave., Cleveland 6, Ohio.

**SEPTEMBER 17-26**—**PRODUCTION AND MACHINE TOOL SHOW** at the International Amphitheater, 42nd and Halsted Sts., Chicago, Ill. Further information can be obtained from the Production and Machine Tool Show, 3 Bridge St., Grafton, Wis.

**SEPTEMBER 18-20**—Twenty-fourth annual convention of the **NATIONAL ASSOCIATION OF FOREMEN** in Los Angeles, Calif. Headquarters Biltmore Hotel, Los Angeles. National director of publicity, Ken Wells, Biltmore Hotel, Los Angeles, Calif.

**OCTOBER 2-4**—Autumn Aeronautic meeting of the **SOCIETY OF AUTOMOTIVE ENGINEERS** at the Biltmore Hotel in Los Angeles, Calif. Secretary and general manager, John A. C. Warner, 29 W. 39th St., New York 18, N. Y.

**OCTOBER 18-24**—Twenty-ninth annual **NATIONAL METAL CONGRESS AND EXPOSITION** at the International Amphitheater, Chicago, Ill., sponsored by American Society for Metals. W. H. Eisenman, national secretary of the American Society for Metals and managing director of the exposition, 7301 Euclid Ave., Cleveland 3, Ohio.

**OCTOBER 20-24**—Annual meeting of the **AMERICAN SOCIETY FOR METALS** at the Palmer House, Chicago, Ill. Secretary, W. H. Eisenman, 7301 Euclid Ave., Cleveland 3, Ohio.

**OCTOBER 20-24**—Annual meeting of the **AMERICAN WELDING SOCIETY** at the Hotel Sherman, Chicago, Ill.

Secretary, M. M. Kelly, 33 W. 39th St., New York 18, N. Y.

**OCTOBER 20-24**—Annual meeting of the **AMERICAN INDUSTRIAL RADIUM & X-RAY SOCIETY** at the Continental Hotel, Chicago, Ill. Secretary, Philip D. Johnson, 53 W. Jackson Blvd., Chicago 4, Ill.

**OCTOBER 23-25**—**INDUSTRIAL MANAGEMENT CONFERENCE** at the University of Missouri, Columbia, Mo. Further information can be obtained from Robert P. Alberts, executive secretary and publicity chairman of the conference, University of Missouri, Columbia, Mo.

**OCTOBER 30 - NOVEMBER 1**—Semi-annual meeting of the **AMERICAN SOCIETY OF TOOL ENGINEERS** in Boston, Mass. Executive secretary, Harry E. Conrad, 1666 Penobscot Bldg., Detroit 26, Mich.

**NOVEMBER 2-5**—Annual meeting of the **NATIONAL TOOL AND DIE MANUFACTURERS ASSOCIATION** at the Benjamin Franklin Hotel, Philadelphia, Pa. Executive secretary, George S. Eaton, 1412 Union Commerce Bldg., Cleveland, Ohio.

**NOVEMBER 3-5**—**NATIONAL ELECTRONICS CONFERENCE** at the Edgewater Beach Hotel, Chicago, Ill. Further information can be obtained from H. S. Renne, 185 N. Wabash Ave., Chicago 1, Ill.

**NOVEMBER 6-7**—Fuels and lubricants meeting of the **SOCIETY OF AUTOMOTIVE ENGINEERS**, at the Hotel Mayo, Tulsa, Okla. Secretary and general manager, John A. C. Warner, 29 W. 39th St., New York 18, N. Y.

**DECEMBER 1-3**—Air Transport meeting of the **SOCIETY OF AUTOMOTIVE ENGINEERS** at the Hotel Continental, Kansas City, Mo. Secretary and general manager, John A. C. Warner, 29 W. 39th St., New York 18, N. Y.

**DECEMBER 1-5**—Annual meeting of the **AMERICAN SOCIETY OF MECHANICAL ENGINEERS** in Atlantic City, N. J.; headquarters, Chalfonte-Haddon Hall. Secretary, Clarence E. Davies, 29 W. 39th St., New York 18, N. Y.

**DECEMBER 4-6**—Annual meeting of the **SOCIETY FOR EXPERIMENTAL STRESS ANALYSIS** at the Hotel Pennsylvania, New York City. Further information can be obtained from the Society, P.O. Box 168, Cambridge 39, Mass.

**JANUARY 12-16, 1948**—Annual meeting of the **SOCIETY OF AUTOMOTIVE ENGINEERS** at the Book-Cadillac Hotel, Detroit, Mich. Secretary and general manager, John A. C. Warner, 29 W. 39th St., New York 18, N. Y.

**MARCH 15-21, 1948**—Sixteenth annual meeting and Tool Exhibition of the **AMERICAN SOCIETY OF TOOL ENGI-**

**NEERS** in Cleveland, Ohio. Harry E. Conrad, executive secretary, 1666 Penobscot Bldg., Detroit 26, Mich.

**MARCH 18-19, 1948**—Fourth annual meeting and exhibit of the **MAGNESIUM ASSOCIATION** at the Pennsylvania Hotel, New York City. Further information can be obtained from the Association, 30 Rockefeller Plaza, New York 20, N. Y.

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## New Watch-Spring Alloy

The production of a new alloy main spring for watches, said to be the most important advance in watch-making since the introduction of jewel bearings in 1704, has been disclosed by the Elgin National Watch Co., Elgin, Ill.

The alloy, known as "Elgiloy," is expected to have possible applications in many industries, including the manufacture of razor blades, stainless cutlery, surgical and dental instruments, gun springs, jet propulsion and gas turbine parts, valve parts, chemical equipment, automotive valve springs and parts, and electronic equipment.

The "Durapower" watch main spring, made from Elgiloy, was displayed by George G. Ensign, director of research of the Elgin company, at a recent press conference. The Elgin official placed a wrist watch movement, powered by a "Durapower" main spring, in a bath of heated aqua regia, a highly destructive acid. Every watch part except the new spring and the jewel bearings dissolved completely in a few minutes. When the liquid cooled an hour later, the main spring and jewels emerged intact and undamaged.

The new alloy has an ultimate tensile strength of 368,000 pounds per square inch, a yield strength of 280,000 pounds per square inch, and a Vickers hardness of 702. It is non-magnetic, and non-rusting even when exposed to salt spray for five hundred hours.

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## Quality Control Course Offered by the University of Iowa

A ten-day course in quality control by statistical methods has been announced by the University of Iowa, Iowa City, Iowa. The course will be given from October 28 to November 7, inclusive, at the university. This is the fifth course offered in this subject by the University. Further information can be obtained from Professor Lloyd A. Knowler, Department of Mathematics, State University of Iowa, Iowa City.

# Announcing

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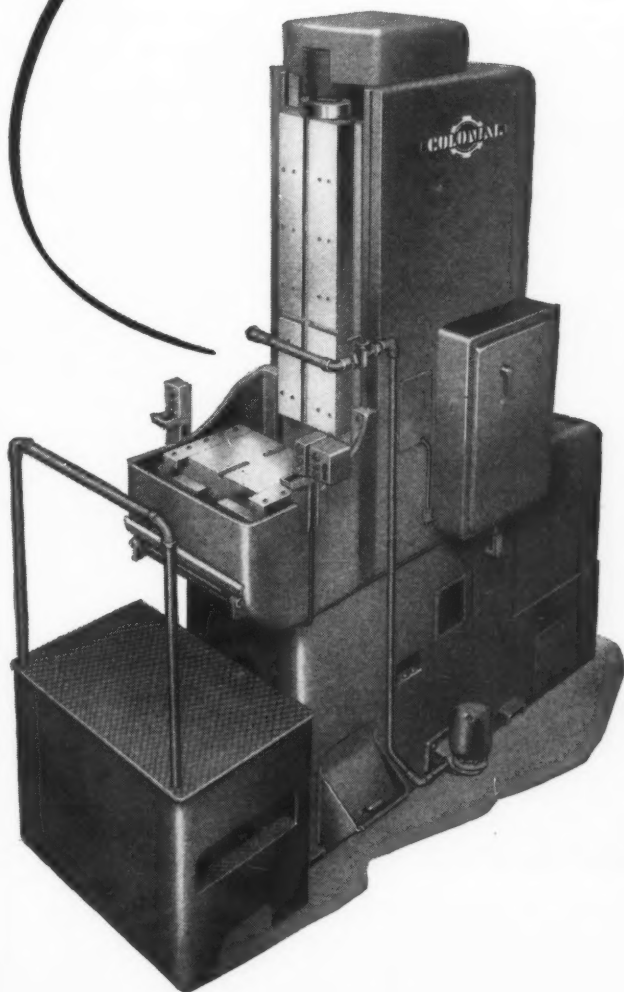
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## Fine-Grained Abrasive for Polishing and Lapping

In the course of wartime research on methods of manufacturing synthetic sapphire, engineers of The Linde Air Products Company, a unit of the Union Carbide and Carbon Corporation, developed an extremely pure and fine aluminum oxide powder. This powder was applied on a limited scale as a polishing abrasive, and proved so successful that it is now used extensively for polishing metallographic specimens, precision bearings, small gears, and Navy searchlight mirrors made of Haynes Stellite alloy.

Two fine abrasives are available, one composed of alpha alumina, having a uniform particle size of 0.3 micron, a Mohs hardness of 9, and a density of 4 grams per cubic centimeter; and one composed of gamma alumina, having a uniform particle size of less than 0.1 micron, a Mohs hardness of 8, and a density of 3.6 grams per cubic centimeter. They are obtained by a combination of conventional production methods, the result being that powders of such uniformity are produced that they can be used for metallographic polishing without first levigating them. They are also extremely pure, and have a great number of cutting edges, which improves the speed of polishing. Some jobs can best be done with the coarser-grained, faster cutting alpha abrasive, while for those requiring the best possible finish the gamma abrasive is preferable. The method of application—applying the powder directly to the work without further preparation or first mixing it with water, oil, or kerosene—depends on the type of work and the preference of the operator.

Polishing of metallographic specimens is the most common application of the powder, but its success in producing excellent cutting edges on steel knives indicates large-scale application in this field. As microscopic mag-

nifications increase, so must the smoothness of the surface of the specimen; otherwise, scratches would interfere with the examination of the structure.

For such operations, the alpha alumina has been found particularly effective, and can be used in the following manner: After the specimen is finish-ground with No. 3/0 emery paper, it is polished with a felt cloth (softer cloths are used on other than ferrous materials) which is sprinkled with the powder and water to form a paste. Later, a fine silk-velvet

cloth may be used to eliminate final scratches, with the powder applied as before. The same technique has been used with considerable success on casehardened specimens, where the problem is to remove an equal amount of material from the hardened case and the softer core, so that the polished surfaces will remain in the same plane.

Other applications include the polishing of such products as shaft pivots and journals for watches and precision instruments, gem stones, and microtome knives for the medical profession. The powder has also been used for the lapping in of small gears.

## Crucible Steel Co. Completes New Spring Plant

A new plant for the manufacture of railroad car, locomotive, and heavy equipment springs has recently been completed by the Crucible Steel Co. of America. This plant, located in Pittsburgh, marks the first step in a \$30,000,000 improvement and expansion program planned by the company. New billet and bar mills and rolling mills for stainless and alloy steel sheet are nearing completion at Midland

and Pittsburgh, Pa.; improved manufacturing facilities for tool steels are being added at Syracuse, N. Y.; and new buildings are nearly ready for occupancy by the La Belle agricultural steel division, Midland, and the Spaulding and Jennings Works in Harrison, N. J.

Products include heavy-duty coil and elliptical springs in many sizes and shapes, as shown in the accompanying illustration; some of the latter types contain over twenty plates of steel and are tested at weights of tens of thousands of pounds—50 per cent more than their prescribed weight load. Perhaps the largest coil spring built at the plant is a unit 51 inches high, made of thick silicon-manganese steel bars, which is employed in the coupling mechanisms of freight cars.

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With only 6.6 per cent of the world's population and 5.9 per cent of its surface area, the United States has 80.9 per cent of its passenger cars and 56.7 per cent of its trucks. Certainly these figures indicate the progressiveness of the free enterprise system.



Coil Springs Produced at the Spring Works of the Crucible Steel Co. of America in Pittsburgh, Pa.